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Report of Committee

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THE NUTRITIONAL VALUE OF OYSTERS AND OTHER SEA FOOD*

D. BREESE JONES, PH.D.

Bureau of Chemistry, United States Department of Agriculture, Washington, D. C.

AVAILABLE INFORMATION regarding the nutritive value of shellfish, such as oysters, clams, crabs, lobsters, and shrimp, is very meager notwithstanding the importance of this class of food in the diet of man since prehistoric times. Oysters constitute the most valuable fishery product of the United States. It has been estimated that the annual yield in this country is about 18,350,000 bushels, with a return to the fishermen of nearly thirteen million dollars.

Shellfish as a source of food presents several interesting features. Land crops that furnish us with food, such as grains, fruit, vegetables, and indirectly, animal products, derive their nourishment from the more limited confines of the soil and the atmosphere, while the shellfish that are harvested from the "boundless deep" are constantly bathed by that universal solvent which supplies every element that is required for the growth of a living organism. Shellfish contain relatively large amounts of mineral constituents. The human body has many elements the significance of which are as yet unknown. Much progress has been made during recent years in studying the part played in nutrition by calcium, phosphorus, iodine, iron and other elements and their relation to such diseases as rickets, goiter and anaemia. It is not improbable that research in the near future will reveal equally important and specific functions in physiological processes for such elements as copper, manganese, arsenic, cobalt, nickel and others which are even now claimed to be normal constituents of animal and plant tissue. Sea food contains all of these elements collected from that vast chemical storehouse—the ocean.

It has been estimated [1] that one pound of oysters, equivalent to about one pint per day, will furnish approximately 35 per cent of the calcium, 53 per cent of the phosphorus, and 136 per cent of the iron required in the food of an average person daily. According to analyses made in the U. S. Bureau of Fisheries,[2] oysters, clams, and lobsters contain about 200 times as much iodine as milk, eggs, or beefsteak. The importance of foods containing relatively large amounts of iodine is emphasized by the relation that has been discovered between deficiency of iodine in foods and drinking water, and the prevalence of goiter and cretinism.

POOR SOURCES OF FATS AND CARBOHYDRATES

Shellfish are not rich sources of fats and carbohydrates, although they are not lacking in these dietary factors. The edible portions of mollusks and crustaceans range in their fat content from 1 to 2 per cent. Unlike most other types of

* Read before the Food and Drugs Section of the American Public Health Association at the Fifty-fifth Annual Meeting, at Buffalo, N. Y., October 11, 1926.

animal food they contain carbohydrate in the form of glycogen, sometimes called "animal starch." The quantity ranges from 1 to 5 per cent. The other two dietary factors, proteins and vitamins, are well represented in the edible portions of shellfish.

Aside from the importance of oysters as an extensively used item of food, their vitamin content has an additional point of interest connected with the general question of the origin of vitamins. It is well established that animal life is dependent upon the vegetable world for its source of vitamins, with the exception of vitamin D. The material upon which oysters feed consists largely of diatoms and minute organisms, marine forms of life to which has been traced the origin of vitamin A, found so abundantly in certain fish liver oils, such as that of the cod. Small marine animals feed on these vegetable organisms, and store the vitamins in their tissues. These lower forms of animal life become a prey for larger species, which successively pass on the vitamin, until it is found in such fish as the cod, herring, and haddock.

On account of the very limited knowledge available regarding the vitamin content of sea food, work was started in the Bureau of Chemistry to obtain more information regarding the nutritive value of shellfish from the standpoint of their vitamin content and of the nutritive quality of their proteins. Our work has yielded data concerning vitamins in oysters, and the proteins in oysters, clams, and shrimp. The work is still in progress.

Results thus far obtained show that oysters are a good source of vitamins A and B. Clams do not appear to be as good a source of vitamin B, while on the other hand the crude proteins of clams have given better results than have those of oysters.

The proteins of shrimp have also been studied, both chemically and by feeding experiments. The amino acid content of the muscle of shrimp is not differentiated from that of the muscle of higher animals by any marked variations. The feeding experiments have shown that the proteins of shrimp muscle are of good nutritive character.

VITAMIN CONTENT OF OYSTERS

Randoin[3] has previously reported that oysters contain vitamin C, the antiscorbutic vitamin. We have found that they also contain vitamins A and B.

Two feeding methods are in general use for testing substances for vitamins, the prophylactic method and the curative method. For the determination of vitamin B in oysters we used both methods. The results obtained by the one method served as a check on those obtained by the other.

In the first experiments with oysters, we used a product that was prepared by dehydrating fresh oysters at a low temperature, not over 45° C., and at reduced atmospheric pressure. During this process some chemical change took place which rendered the product so distasteful to the animals that only in a relatively few cases were we able to get them to eat the required experimental quantities of the oyster. We, therefore, had to resort to some other method, which, without impairment to its vitamin properties, would yield a product having uniform composition, and which was both palatable and could be satisfactorily weighed out in the desired quantities. This was accomplished by grinding fresh oysters in a frozen condition. It has been shown[4] that freezing temperatures have no appreciable effect on vitamins. Suitable quantities of the frozen product were then weighed and fed to the rats daily, apart from the rest of their diet.

VITAMIN B IN OYSTERS

In the tests carried out by the prophylactic method for estimating vitamin B in oysters, young albino rats weighing from 45 to 50 grams were fed a basal diet containing adequate quantities of all of the food factors required for the normal

growth of rats, with the exception of vitamin B. This diet was composed of an intimate mixture having the following composition:

Casein (vitamin B-free)	20 parts
Inorganic salt mixture (Osborne and Mendel)	5 "
Butter fat	15 "
Starch	60 "

Separate from this ration there was given additionally each day the portion of oysters which was being tested.

We started out with 3.5 grams of frozen oysters daily. Rats will make but little or no growth, and can live but a short time, on a ration lacking in vitamin B, such as the basal ration used. The animals that received 3.5 grams of oysters grew at a very satisfactory rate for about sixty days. After that their rate of growth was more or less retarded.

With 2 grams of oysters daily the animals grew at a fair rate for about three weeks. For the next 60 days they barely maintained their weight. When 1 gram of oysters was given, growth at a slower rate during the first 2 or 3 weeks resulted followed by a decided decline in weight.

These results show that 3.5 grams of fresh oysters daily is *nearly,* but not quite, sufficient to provide the necessary amount of vitamin B for the normal growth of young rats. Oysters apparently contain a very significant amount of vitamin B.

It is of interest to compare the results obtained by the prophylactic method with those obtained by the curative method. In the latter case, the animals received only the basal diet until positive indications of vitamin B deficiency were apparent, such as loss of weight and general manifestations of malnutrition. Then, the animals were given daily 5 grams of oysters. The almost immediate response shown by resumption of growth was marked and their subsequent rate of growth was excellent.

Even 3.5 grams of oyster daily enabled the animals to respond as promptly as did those that received 5 gram portions, but the subsequent rate of growth was not quite as rapid, and at the end of about 35 days there was a tendency for a slight retardation of growth.

When the amount of oyster given daily was reduced to 2 grams, decline in weight was arrested and growth at even a fair rate in some cases followed for three weeks or more.

The results obtained by these two methods for estimating vitamin B in oysters, the curative method and the prophylactic method, agree well. They show that 3.5 grams of raw oyster given daily just falls short of providing enough vitamin B to meet the growth requirements of rats.

The frozen oysters as fed in these experiments contained 84 per cent of water. When the various quantities used, namely, 5, 3.5, and 2 grams, are calculated to a moisture free basis, they represent respectively 0.8, 0.56, and 0.32 grams of dry oysters. On this basis, oysters compare favorably as a source of vitamin B with foods which are recognized as excellent sources of this dietary factor.

VITAMIN A IN OYSTERS

As a criterion for estimating vitamin A, we have used the method of finding out the effectiveness of different quantities of oyster for curing xerophthalmia that had developed as a result of feeding rats a diet deficient in this vitamin. After unmistakable symptoms of xerophthalmia were manifest, the value of different quanties of the oyster for curing the eye affliction was determined by feeding different groups of animals daily portions of 3.5, 2, and 1 grams of the frozen oyster. The vitamin A-free basal ration had the following composition:

Casein (Vitamin A-free)	20 parts
Salt mixture (Osborne and Mendel)	5 "
Crisco	15 "
Starch	60 "

Vitamin B was supplied to each animal by 0.4 gram of yeast given daily, apart from the basal ration.

The animals receiving 3.5 grams of oysters showed, in most cases, rapid improvement in the condition of their eyes as well as in their rate of growth. The

time required for restoration of their eyes to normal condition varied somewhat with the severity of the ophthalmia. With the exception of two or three cases where the disease had progressed to such a degree that their eyes were irreparably damaged, the animals were cured in most instances in about ten days.

Two gram daily portions of the oysters also enabled the animals to recover from xerophthalmia about as soon as did the 3.5 gram portions. Their resumption of growth, however, was at a much slower rate. One gram of oysters had but little, if any, curative effect.

Work is in progress on the estimation of vitamin D, the antirachitic vitamin, but thus far we have not secured sufficient data to justify the drawing of any conclusions.

PROTEINS

In order to get more or less comparable results on the nutritive values of the proteins of oysters, clams, and shrimp, as judged from their capacity to promote growth, the different substances tested were incorporated in the diets in such quantities that they would furnish about 9 per cent of crude protein. The protein content of the product tested was calculated by multiplying the nitrogen percentage by the factor 6.25. This is a rather low intake level of protein in the diet, and is about the minimum on which young rats will grow satisfactorily even on proteins of the best quality. By using a low percentage of protein in the diet, it is easier to detect small deficiencies in the nutritive properties of a protein.

PROTEINS OF OYSTERS

For the estimation of the growth-promoting value of the proteins of oysters, fresh, shelled oysters were heated to coagulate the proteins, drained, and dried in a current of warm air. They were then ground to a meal. The material thus prepared contained 47.8 per cent of crude protein. It was incorporated in the ration as the sole source of protein, with the exception of a negligible quantity contained in the small amount of yeast which was given to furnish vitamin B. The composition of the ration is shown in Table I. On this ration, young rats weighing from 46 to 51 grams at the start of the experiment, grew very uniformly for as long as 7 months, although at a rather slow rate. There are several factors which I will not have time to dwell upon, that must be taken into consideration when interpreting the results of these experiments. Were it possible to make allowances for these factors there is but little doubt that the growth promoting value of the oyster proteins would show up better than the results obtained indicate.

TABLE I

COMPOSITION OF THE RATIONS

	Oyster diet	*Clam diet*	*Shrimp diet*
Dried oyster	18.8	....	....
Dried clam	....	15.8	....
Dried shrimp	....	....	9.63
Salt mixture	5.0	5.0	5.00
Crisco	20.0	20.0	20.00
Starch	56.2	59.2	65.37

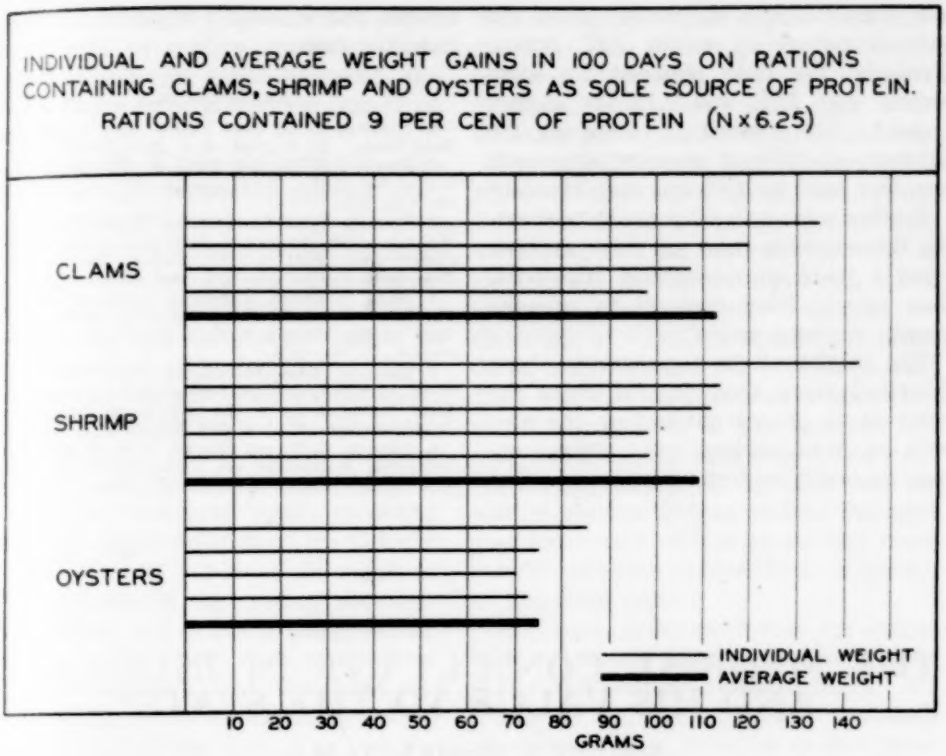
0.2 gram of yeast and 0.3 gram of cod liver oil were given daily to supply vitamins.

PROTEINS OF CLAMS

Hard shell clams, also known as quahaugs, were prepared for the feeding tests in the same way as the oysters, and the tests carried on in the same manner. For 170 days the animals grew on this ration at a quite satisfactory rate, approximating in some cases what may be considered a normal rate.

PROTEINS OF SHRIMP

Studies to determine the nutritive quality of the proteins of shrimp were carried on both chemically[5] and biologically. We were enabled to do this because the muscle, the edible portion of the shrimp, after having been extracted with alcohol and ether, consists of a white, fibrous substance, composed almost entirely of protein. It was possible, therefore, to submit this product to the usual procedures uses in protein analysis for estimating amino acids. The results of these analyses (Table II) show that shrimp muscle contains relatively high percentages of those amino acids known


INDIVIDUAL AND AVERAGE WEIGHT GAINS IN 100 DAYS ON RATIONS CONTAINING CLAMS, SHRIMP AND OYSTERS AS SOLE SOURCE OF PROTEIN. RATIONS CONTAINED 9 PER CENT OF PROTEIN (N x 6.25)
CLAMS
SHRIMP
OYSTERS
INDIVIDUAL WEIGHT
AVERAGE WEIGHT
10 20 30 40 50 60 70 80 90 100 110 120 130 140
GRAMS

to be indispensable for the normal nutrition of animals. From these figures it could be predicted with a fair degree of assurance that shrimp muscle contains protein of satisfactory nutritive quality. These expectations were later substantiated by the results obtained from feeding experiments.

TABLE II

PERCENTAGES OF SOME AMINO ACIDS IN SHRIMP MUSCLES

	Per cent
Cystine	1.78
Arginine	10.24
Histidine	3.78
Lysine	7.60
Tryptophane	1.21
Tyrosine	4.88
Aspartic acid	6.98
Glutamic acid	15.00

For the feeding experiments, fresh shrimp muscle was dried and ground to a meal. A ration containing a quantity of the shrimp meal representing 9 per cent of protein (Table I) enabled animals to grow for over 18 weeks at a very good rate.

Chart I shows the comparative gains in weight of rats fed the oyster, clam, and shrimp rations during the first 15 weeks of the feeding experiments. As indicated, there was but very little difference in the rate of growth of the animals receiving the clam and shrimp rations, while those receiving the oyster ration gained only a little over two-thirds as much.

For obtaining further data for comparing the growth-promoting value of the proteins of the three types of sea food studied, figures were calculated showing the ratio between the gain in weight and the amount of protein consumed during a fixed period. Record was kept of the total food consumption for each rat during the period of the experiment. The amount of nitrogen in the food consumed multiplied by the factor 6.25 gave the figure for the crude protein. It was found that for every gram of oyster pro-

tein eaten during a six weeks' period the animals gained in weight 1.27 grams. Similarly, the ratio obtained for clam protein was 2.05, and 2.15 for shrimp protein. This method of comparing the efficiency of different proteins for growth was first used by Osborne and Mendel.[6]

Further work is in progress for estimating the nutritive value of these shellfish from a more comprehensive standpoint than merely their capacity to promote growth in young animals.

The results of the experiments above described show that, judged from the criterion of growth promotion, the proteins of clams, shrimp, and oysters compare favorably with the proteins of other articles that are highly regarded for their nutritive value.

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THE MEDICAL CONSULTANT IN INDUSTRY AND HIS VALUE TO THE STATE*

ROBERT S. McBIRNEY, M.D.

Medical Inspector of Factories, Bureau of Industrial Hygiene, New York State Department of Labor, New York City

THE EVER INCREASING number of industries in this state, once an agricultural commonwealth, brings a change in the factors which concern the health and welfare of its people.

While there is little doubt that "a bold peasantry is its country's pride," yet the road to apparent economic security appears to-day to be shorter through industrialism, with its constant and certain hours of labor, its activity, excitement, shelter from the changing elements of nature, its opportunity for greater comradeship among the workers, and the certainty of one day of rest in seven; having a greater fascination for the men and women of our day and age, much stronger than agriculture may offer.

The change from an agricultural commonwealth to one of industry has shown its greatest strides during the past generation, or quarter-century. In 1880 there were in the State of New York 241,000 farms. In 1900 there were 226,000 and in 1920, 193,000 farms, or a decrease of 33,000 farms, a number greater than the total number of farms in the State of Massachusetts in 1920.

In 1900 there were 35,000 factories in New York State, and in 1926 the total had increased to 65,000, while the wage earners of the manufacturing and mechanical industries for the same period were respectively 755,000 and 1,764,000, exclusive of personnel, managers, salesmen, truckmen, clerks, etc.

While the generation span through which we have just passed has been preeminently one of science, and industry

* Read before Industrial Hygiene Section at the Fifty-fifth Annual Meeting of the American Public Health Association at Buffalo, N. Y., October 13, 1926.

has shown its greatest development, public health and preventive medicine have moved along with equal progress, and usually in the same places, the centers of population.

As a result of this rapid shift in production we have drawn the workers from a farming occupation, instead of from homes where the industrial life has been the only one known for generations. With the lure of high wages, easy money, piece work, and convenient hours of labor, combined with the inherent ignorance of the worker in his environment, the stage is fittingly set for day dreaming, carelessness, selfishness and its frequent result—an accident.

This great industrial army, exceeding in numbers the population of the Colonial United States, is not alone the result of increase in size of the existing manufacturing plants, but is due to many causes, among them the discovery of novel methods of manufacture, new substances, elements, fashions and the desire to put off the old for something new.

The history of the usual health program of a state begins, if you like, with the prenatal care of the mothers of the coming generation. It then follows the baby and the mother very closely for two or three years. When the child enters school, supervision follows for a few more years, and if by chance there are more babies in the family the health worker again comes into the home. Eventually, the child is of an age to either pursue its studies further or seek a livelihood of its own. Selecting industry as the easiest way, we may be sure that within a few years at most another family will be established and thus another home for the health workers to enter with their education, advice, help and authority.

WHY NEGLECT THE FATHER?

But here, it seems, there is discrimination, or an oversight on the part of some one, for the father who is the head of the family and usually the principal wage earner, has been overlooked. Nevertheless, he is the father of the next generation. His physique, his health, his temper, disposition, habits, manners, thoughts, brains and soul have some effect, to put it mildly, upon his children.

One wonders how long a man in the prime of health can withstand the various dusts and fumes of an industry without weakening the full natural resistance of the lungs to pathogenic organisms. How many years will the teeth withstand the chemicals of industry before they break down and become foci of infection? How long can the human organism withstand a pulse rate of one hundred and over before some vital organ weakens? How many attacks of cyanosis can the worker sustain without serious damage? Just how much oil and grease and metal can the skin resist before some symptoms of poisoning occur?

We quite understand that the manufacturer should make provision for the safety and welfare of his workers. Be it said to the credit of many that such provision is made, in so far as they know how, and quite all the law requires.

But, it must be borne in mind, that every day brings forth some new process of manufacture and with it come new men, new ideas, new money, and a new factory with little knowledge of the health hazards involved. Rarely is medical authority consulted, until and unless the organization reaches such proportions that accidents become a custom. And then only, as is the case in the vast majority of factories in the state, does this act unless called upon.

STATE INDUSTRIAL MEDICAL SERVICE SOUGHT

Thousands of such small factories do not have or cannot support a mechanical engineer. Thousands of them have no physician or nurse, though plenty of them could well afford a full-time medical officer. The economic struggle is so intense that the services of a physician seem a waste of money. Where then shall the small manufacturer obtain such advice and counsel as is needed to make his fac-

tory safe and sane for the worker, if not from the state?

We have the state department of agriculture to advise the farmer, the state department of education to assist and advise in matters of education; the state banking department, health department, public utilities and so on, each one a clearing house of information and advice embracing its particular field. So for the great industrial field, with its army of industrial workers, we have a labor law, with its various codes for the guidance of the manufacturer in providing protection for the workers.

There is hardly an industry known which does not have its own peculiar accidents or harmful substances; fortunate indeed is that industry, which owing to its economic security or far-seeing business sagacity can provide a full time medical advisor and consultant to watch over the health of its workers. With proper qualifications he soon becomes one of the most trusted and valued heads, though his field of industrial medicine is too often limited to his own industry. The increasing efforts and inventions of science to find cheaper methods of manufacture are constantly bringing up new health hazards for old ones, and in order to prevent accidents and illness under the new conditions the manufacturer and his medical advisor must seek counsel or wait and learn by experience.

ENLIGHTENED PUBLIC OPINION NEEDED

This slight attention given to the new working conditions in the factories, as well as the little interest shown in the small manufacturers' problems in meeting them is a fault which will only be remedied by an enlightened public opinion—the same force which gave us our public health programs.

Whatever affects the human organism adversely must be confronted, soon or late, by the trained medical mind. Who but the physician understands the reaction of the human eye to darkness and light? Who else studies the physiological reaction to cold, heat, humidity and improper posture; proper clothing, feeding, bathing, worry, fatigue, rhythm, sanitation and intelligence quotients? These are only a few of the factors which enter into the health and welfare of industrial workers.

When New York was largely an agricultural state, no one objected to all the advice and counsel and experimental stations the farmers thought were necessary for their convenience. But to-day the state is almost wholly industrial, while still holding high rank in the nation as an agricultural commonwealth. The urban population of the state in 1920, was 8,500,000 while the rural was 1,790,000, and the value of all manufactured products for 1919 was $8,867,000,000 as against the total of farm crops and live stock products of $643,000,000.

Obviously, it seems no more than fair and proper that any state, wherein its people gain their living from work in the industries, must be as willing to furnish such aid, counsel and advice to the small or big manufacturer, as it has ever been to aid the farmer, give advice on health, or counsel in scholastic education.

OBLIGATIONS OF THE STATE

Just how can a state control, prevent or exterminate communicable diseases without knowing where they occur and their exact nature?

For the reduction, control, and obliteration of the growing thousands of industrial health and traumatic menaces, there should be required, it would seem, an immediate report—within 48 hours—to a bureau or division of a department having jurisdiction over the industrial field.

Such a bureau or division would know at once where accidents or diseases are occurring, what particular type of industry is suffering most, in truth, the very machines or elements responsible for the greatest damage.

Not only would these reports give a clue to the location and character of in-

dustrial mishaps, but would also furnish the knowledge necessary for careful study, sifting, compilation and research which must follow in any campaign of cure and prevention.

Necessarily, there would have to be qualified and experienced medical consultants in industry to make investigations of the problems of the manufacturer and the industrial surgeon, and give advice, counsel and recommendations to the thousands of small industries; there should be also chemists, engineers, expert safety advisers, laboratory facilities, research investigators for the special study of occupational diseases, special ventilating engineers and experts in illumination to assist in the solution of these problems.

The small manufacturers, those just entering the field in a new venture, and the industrial surgeon, should realize that there is in the State of New York in the Department of Labor, a Bureau of Industrial Hygiene which is striving in every way to give aid, advice, counsel and help to secure ideal factory conditions for the health of the workers, and lessening liability of owners. If some of the largest and best factories in the state, equipped with all modern devices and a medical staff, find it profitable and enlightening to ask for investigations and recommendations covering their working conditions, certainly others less fortunate should make use of such expert services.

There should be no barrier in the way of providing a competent and adequate clearing house of information and advice for the manufacturer and the industrial surgeon, to the end that the physical fitness, vigor, good habits and healthy childhood which were established by a persistent health program during youth will not be broken down in early adult life for want of a program and a policy to maintain the healthy physique and manhood of the fathers in the shops.

Why the Child Needs Play—Life today has become so complex and stimulating to the emotions that even children are showing evidence of the strain. Next to sleep, nothing will so well postpone and prevent fatigue as play. Play furnishes an outlet for surplus energy, it imitates the activities of primitive peoples, but particularly it is a time of rehearsal of experiences that the child will have in later life.

To the child, play is a business as serious and important as study or work is to the adult. The free play of motor activity furthers the child's instinct of imitation, develops his imagination, and furnishes him with new feelings, knowledge, desires, and abilities. In late childhood play develops the social impulse and lays the foundation for social relationships of later life. Play has a wholesome effect on both body and mind.

Care is essential in the selection of suitable toys. Their purpose is not merely to amuse, but to develop mental alertness and stimulate the imagination. Especially in early childhood is there the temptation to provide toys which the child cannot manipulate himself. The danger in this is that he may form the habit of becoming an onlooker instead of an active participant in play, thus losing independence of action. If the mother plays constantly with the child, there is danger that her recognized leadership may repress the child's spontaneity and hamper the development of self-confidence.

The younger the child, the more play he needs, but at any period of development and any season of the year the child needs his daily ration of play. Nothing so contributes to growth, health and efficiency as play that allows for free motor activity in the open.—Max Seham, *Hygeia*, Sept. 1926.

SWIMMING POOLS AND OTHER PUBLIC BATHING PLACES*

STANDARDS FOR DESIGN, CONSTRUCTION, EQUIPMENT, AND OPERATION

DURING the past six years separate Committees on Bathing Places of the Public Health Engineering Section of the American Public Health Association and of the Conference of State Sanitary Engineers have been very largely identical in personnel, and have worked practically as a single body making separate though similar reports each year to both organizations. At the meetings of both organizations in 1925 it was voted to unite these two separate committees into a joint committee representing both bodies.

At the time when these committees were instituted the practice as to construction, equipment and operation of swimming pools varied widely in different states and in different communities within the state. Furthermore, although it was beginning to be recognized that certain diseases might be spread through the medium of improperly conducted public bathing places, the control measures necessary to insure proper cleanliness and sanitation had not been formulated.

In previous reports the committee has presented certain evidence as to the causation of various transmissible diseases by the waters of poorly constructed and equipped or improperly operated swimming pools, by bathing in polluted waters and by the use of incompletely sterilized bathing suits and towels, and the need of improved bathing place sanitation throughout the country. In the 1923 reports the committees proposed certain tentative standards for the physical, chemical, and bacterial quality of swimming pool waters together with certain operating regulations for the maintenance of those standards. In the 1925 reports the committees presented information as to the measures necessary for the safety of bathers and for the prevention of accidents.

During recent years there has been a widespread demand that the committee correlate the data included in its reports with other unpublished information which has accumulated in its files and formulate a standard code of bathing place sanitation. In compliance with this demand the report of the joint committee to the conference of State Sanitary Engineers in May, 1926, proposed a rather complete code of standards for the design, construction and equipment of swimming pools together with certain standards for other bathing places. With certain minor changes which have seemed advisable following discussion at the conference and from the comments received from swimming pool designers, makers of swimming pool equipment, and others, and with the incorporation of the tentative standards of water quality, etc., presented in the 1923 report of your Committee on Bathing Places, we now offer the appended code of Standards for the Design, Construction, Equipment, and Operation of Swimming Pools and Other Public Bathing Places, for the consideration of this section.

* Report of the Joint Committee on Bathing Places of the A. P. H. A. and the Conference of State Sanitary Engineers, presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-fifth Annual Meeting, at Buffalo, N. Y., October 12, 1926.

RECOMMENDATIONS

In accordance with the usual procedure in the preparation and adoption of standards, the committee would recommend:

1. That the appended standard code be approved in principle as a whole by this section.

2. That these standards be referred back to the Committee on Bathing Places for such minor correction and revision as may be advisable.

3. That the committee be instructed to present a final report on standards for adoption at the next meeting of this section.

STANDARDS FOR DESIGN, EQUIPMENT, AND OPERATION

I. Classification of Bathing Places

A. The term "bathing place" as used in this report includes all bodies of water sufficiently deep for complete immersion of the body and used collectively by numbers of persons for swimming or recreative bathing, together with the shores, buildings, equipment, and appurtenances pertaining to such bathing places. It does not include public or semi-public baths, where the main object is the cleansing of the body or the practice of the healing art, unless such baths contain pools or tanks used collectively by a number of individuals.

B. Bathing places may be divided into three classes:

1. Natural outdoor ponds, rivers, tidal waters, etc.
2. Outdoor pools which are partly artificial and partly natural in character
3. Pools outdoor or indoor which are entirely of artificial construction

Natural ponds and rivers are necessarily dependent upon natural flow or upon wind and wave action for circulation of the water. Artificial and partly artificial pools may be divided into four classes according to the method by which water cleanliness is obtained.

a. Large semi-artificial pools in which the water cleanliness is maintained by natural flow or circulation.

b. Fill and draw pools where cleanliness of water is maintained by complete removal and replacement of the water at periodic intervals.

c. Flowing through pools where cleanliness is maintained by circulation of water through the pool from some natural or artificial source, but where the outflowing water is wasted.

d. Recirculation pools in which circulation of the water is maintained through the pool by pumps, the water drawn from the pool being clarified by filtration before being returned.

II. General Principles of Bathing Place Sanitation

A. In the control of swimming pool and bathing place sanitation certain broad principles apply to all classes of public bathing places.

B. The committee is of the opinion that all public bathing places both natural and artificial should be under the sanitary control of the public health authorities.

C. In the opinion of the committee the same standards of cleanliness and bacterial purity of the water and the same precautions against the possible spread of disease should apply at both indoor and outdoor swimming pools.

D. The requirements should be the same for all artificial and semi-artificial pools whether located indoors or outdoors, so far as the features of design and equipment apply to maintenance of cleanliness of the pool and of the water with which it is filled.

E. At public bathing beaches on natural waters the same sanitary standards should apply to bathing houses, dressing rooms, toilet facilities, and to the handling and care of bathing suits, towels and other articles of bathing apparel as would be required at artificial swimming pools.

F. Sanitary drinking fountains with a supply of pure water should be installed at all bathing places. The common use

of towels, drinking cups, combs, hair brushes, or other toilet articles should be strictly prohibited.

III. Bathing Beaches

A. It is very desirable that the bathing waters at public bathing places on natural streams, lakes and tidal waters should be of the same standard of bacterial quality as is required for swimming pools. It is also desirable that the same standard of cleanliness be applied, although it may at times be necessary to sanction public bathing in waters which contain more turbidity and color than would be permissible in an artificial pool.

B. In the selection of a natural bathing beach a careful study should be made of the possibility of pollution by sewage, giving due regard to natural currents, wind action, and similar factors. Attention should also be paid to the possibility of fouling of the waters and beach by algae or by aquatic plants growing on the bottom or washed in from outside.

C. The shore and bottom at a natural beach should be of sand with no sudden slope or holes up to a water depth of six feet. There should also be no swift treacherous currents or submerged rocks or other dangerous obstructions within the bathing area.

D. In a number of instances disinfection of waters at natural bathing beaches has been carried out with considerable success. At Washington some years ago the waters of the so-called tidal basin were treated with liquid chlorine applied from a boat, and this procedure has since been used at other places. At Detroit, in 1925, the waters of the river were treated with liquid chlorine from a perforated pipe laid in the bottom of the river a short distance above the public bathing beach. The results of both these methods of safeguarding bathing have been reasonably satisfactory. The amounts of chlorine to be used in treatment of natural bathing waters should be governed by the same requirements as defined in the committee standards for artificial pools.

IV. Location and Layout of Pools

A. The location of an outdoor pool will be governed largely by local conditions; and arrangement of dressing rooms, etc., can be made to conform to the sanitary requirements. In locating an indoor pool careful study must be given to architectural and engineering features in order that the proper layout may be obtained.

B. The layout or arrangement of entrances and exits of the pool room in relation to dressing rooms, showers and toilets must be such as to enforce proper routing of bathers. Coming from the dressing room a bather should be required to pass the toilets, and go through the shower room before arriving at the pool entrance. Bathers should leave the pool through a separate exit leading to toilets and dressing rooms.

C. At pools used simultaneously by both sexes separate entrances and exits should be provided for men and women. There should be no connection between men's and women's quarters.

D. Entrances and exits must be located at shallow water portion of the pool.

E. If pool is to be of recirculation type, ample room must be provided for filters and other units. All recirculation piping, inlet and outlet valves, etc., must be located where they will be readily accessible.

F. At indoor pools where liquid chlorine disinfection is to be used, it is recommended that the chlorine apparatus be located in a glass enclosure in the pool room in order that dosage may be under the immediate supervision of the pool attendant.

V. Design and Construction Features

A. *Material:* Any material which will provide a tight tank with smooth and easily cleaned surfaces may be used for artificial swimming pools.

B. *Details of Design:* The details of design in so far as they relate to strength of material, water-proofing, etc., are essentially the same as in design of other

tanks of similar size and shape and are, therefore, omitted from this report.

In the design of a new pool provision should always be made for complete circulation of water through all parts of the pool during the bathing period. Without proper circulation it is difficult or impossible to maintain good sanitary conditions at all times, even though the pool be completely emptied, cleaned, and refilled each day. The installation of new fill and draw pools cannot be recommended.

C. *Shape:* Indoor pools should be of rectangular shape with deep water at or near one end and shallow water at the other. Small outdoor pools should be of same general design as indoor pools. The best shape for large outdoor pools depends largely on the size and on local conditions. It is considered better practice to build large pools with the deep water area in the center.

D. *Dimensions:* For swimming records a straight away course of at least 60 feet with 5 foot lanes is required. Length of pool should be not less than 60 feet and width should be some multiple of 5 feet. The area to be provided for the expected bathing load is discussed in a subsequent chapter.

E. *Depth of Water:* The minimum depth of water in the deep portion of any public pool should be not less than 6 feet.

F. *Proportion Deep and Shallow:* Some authorities recommend that the area of shallow water, 5 feet or less in depth, should be 80 per cent or more of the total area of large outdoor pools. Such proportioning must be considered in relation to the pool volume, the bathing load, the recirculation or flowing through purification system, etc. The committee has insufficient information on this point to warrant any recommendation at the present time.

G. *Slope of Bottom:* The slope of the bottom of any part of a pool where the water is less than 6 feet deep must not be more than 1 foot in each 15 feet. There should be no sudden changes of slope within the area where water depth is less than 6 feet.

H. *Side Walls:* The side and end walls of all artificial and semi-artificial pools should be vertical. Sloping side walls are dangerous and cannot easily be kept clean.

I. *Pool Lining:* Including bottom and sides up to runaways lining must be of white or light color material and present a smooth finished surface without cracks or joints. All corners must be rounded. Tile or glazed brick lining is recommended for all indoor pools and for small outdoor pools. White cement smoothly finished is satisfactory for large outdoor pools. Dirt does not show on asphalt or other similar dark material and such materials are not suitable for pool lining. The use of paint or similar material to obtain a light colored finish is not satisfactory and should not be permitted. Sand or earth bottoms cannot be kept clean and are not recommended for pools.

J. *Markings:* It is recommended that swimming lanes be marked on the bottom with dark colored material of the same kind as pool lining. The outlet of the pool should also be plainly marked by a black or dark colored circle, unless outlet grating is of conspicuous coloring. The depth of water at the deepest point and at the 5-foot point should be conspicuously marked on both sides of a pool with deep water at one end. Markings showing depths in 1-foot increments are desirable. In large pools with deep water only in the middle the 3- and 5-foot depth line should be conspicuously marked on the bottom and also designated by surface floats.

VI. Proportioning Pool Area to Expected Load

A. In the design of an artificial pool due allowance must be made for the number of bathers who may be expected at the time of maximum use. In computing the area which must be provided it is recommended that the pool be divided into three zones, and the area of each computed separately.

B. From the data collected by the committee for its fifth report it was the consensus of opinion that an area extending 10 feet from the extremity of a diving board or tower should be considered as reserved for divers, and that not more than two or three persons should be permitted in the water in this area at one time while diving is in progress. About three times that number will be on the shore or diving platform awaiting their turn to dive. Twelve persons is therefore the maximum number which may be permitted for the area within 10-foot radius of each diving board or platform.

C. It was the consensus of opinion of swimming pool operators that the space required by a swimmer might fairly be expressed as five-fourths the square of his height and that on an average two-thirds of the swimmers present would be in the pool at the same time. On this basis the average space requirement for an adult swimmer is 36 square feet and allowing for one-third of swimmers on the shore, an average of 27 square feet should be provided for each swimmer who may be expected to be present at time of maximum load.

D. In computing the area to be provided for persons who do not swim we must take into consideration the character of the pool. At indoor pools and small outdoor pools this area should probably be included with the swimming area and the crowding limit computed as such. At large outdoor pools where a considerable proportion of the water is shallow water, we may assume that 50 per cent of the non-swimmers would be on shore. The average space allowance for each non-swimmer in the water is approximately one-half that of the swimmer in deep water. Combining these factors an allowance of 10 square feet per bather should be allowed for this portion of the pool.

VII. Inlets and Outlets

A. All pools should be provided with an outlet at the deepest point of sufficient size to permit the pool to be completely drained in four hours or less. Outlet opening in the floor of the pool should be at least four times the area of the discharge pipe to reduce suction currents. This opening must be covered with a proper grating.

B. In rectangular pools with deep water at or near one end, multiple outlets should be provided where the width of the pool is more than 20 feet. In such cases outlets should be spaced not more than 20 feet apart, nor more than 10 feet from side walls.

C. Proper pipe connections must be provided in recirculation pools to permit water being drained directly to the sewer, as well as to recirculation pumps. In making connections of pool outlets with sewers proper care must be taken to prevent any possibility of sewage from the building or from outside backing up into the pool.

D. Inlets for fresh or re-purified water should be located to produce as far as possible a uniform circulation of water throughout the entire pool. In semi-artificial pools of irregular shape a careful study should be made of probable circulation currents and inlets located and spaced to provide as complete circulation as possible. All inlets should be located at the shallow water portion of the pool and not more than 1 foot below water line, except in case where reverse circulation is used as discussed in paragraph H.

E. Where the distance across the shallow portion of the pool is more than 20 feet, multiple inlets must be provided, so spaced that each inlet will serve a linear distance of not more than 20 feet. At spoon shaped rectangular pools where the outlets are located more than 5 feet from the end wall, inlets should be placed at both ends of the pool. At large pools with outlets near the center, inlets should be placed at the specified intervals entirely around the perimeter of the pool.

F. In small rectangular pools with only a single inlet and a single outlet, inlet and outlet should be located on a line

drawn lengthwise through the center of the pool. Inlet orifices located at or below normal water level should be covered with a grating having openings of at least twice the orifice area.

G. Each inlet should be designed as an orifice and proportioned to supply the volume of water required at that particular point to obtain the best circulation. Inlet piping should be designed to provide at least twice the area of the inlet orifice. In large pools the inlet pipe system should be designed in sections with gates to permit regulation of the flow to different inlet orifices.

H. In a few cases pools have been designed for fresh water or re-purified water to enter at the deep point and overflow through outlets or scum gutters in the shallow portion. It is believed there may be some advantage in having flow through the pool in this direction, thus permitting floating matters and dirtier waters from the more crowded shallow area to be carried off more rapidly. The committee suggests that in designing piping systems for recirculation or flowing through pools, cross connections be provided so that flow through the pool may be in the direction which experiments may prove most desirable. It is also suggested that the question of having scum gutters serve as overflows and outlets in recirculation or flowing through systems be studied more carefully, as it appears that such design may have certain material advantages.

VIII. Scum Gutters

A. Scum gutters should extend completely around the pool. The design of scum gutters should be such that matters entering them will not be washed out by a sudden surge of entering water, and that danger of bathers catching arms or feet in them be reduced to a minimum. The edge of a scum gutter should be designed to serve as a hand hold for bathers. Gutters should, therefore, be sufficiently deep that bathers' fingers will not reach to the bottom. Sufficient opening must be provided to permit mechanical cleaning of the gutters.

B. Drainage outlets should be provided at least every 10 feet and the gutter bottom should pitch slightly to these outlets. Outlets and outlet pipes should be of generous size to permit rapid carrying away of water during surface flushing or reversed flow. Drainage from scum gutters may be conducted directly to sewers or to suction of recirculating pumps. Both such connections are advised.

C. All scum gutters should be recessed into the pool wall. There is no legitimate objection to having scum gutters project slightly into the pool to permit drainage from runways to flow directly over the edge of the pool into them. Such projection should not, however, be more than 2 inches.

IX. Steps, Ladders and Step Holes

A. Steps or stairways for entering and leaving the pool should be of such construction as to minimize danger of accidents. Ladders or stairways should be located at one or both sides of the deep end of the pool. If the distance from the bottom of the pool to runway is more than 2 feet, a ladder or steps should also be placed at the shallow end of the pool. Treads of ladders or steps should be of non-slip material.

B. In some pools ladders have been replaced by step holes inserted in the pool wall. If step holes are provided, they should be of such design that they may be readily cleaned and be provided with drains into the pool to prevent accumulation of dirt.

C. Stairs, ladders, or step holes should have a hand rail on either side at the top leading out over the runway. Stairs should not project into the pool. If stairs are desired, the stairway should be recessed into the wall and the runway of the pool.

X. Runways or Sidewalks

A. Runways not less than 4 feet wide should extend entirely around the pool.

Runway floors should have a slope of about ¼ inch to the foot, should be smooth and easily cleaned, but should be as far as possible of non-slip construction. The edge of the pool runway must be of non-slip construction for a width of at least 1 foot. The edge of the pool at its junction with the runways should be rounded. At indoor pools, unless runways are very wide, handrails on the outside wall are desirable.

B. The older practice was to require runways of all pools to slope away from the pool with drainage vents at intervals connecting with the sewer. Such a requirement seems unnecessary for indoor pools. The water carried out on runway is of the same character as that in the pool. Modern trend of opinion is toward having runways of indoor pools slope toward the pool with drainage into scum gutter or scum gutter drainage system. At outdoor pools so located that much dirt is blown in from outside it is desirable to have the runways slope away from pool to permit flushing such dirt directly to the sewers.

C. Some sanitary authorities also require a raised edge 2 inches or more in height between the pool and runways. Such a raised edge may lead to accidents by bathers tripping thereon and cannot be recommended for indoor pools. At outdoor pools a raised edge forms a barrier between pool and runway and permits the use of greater hose pressure for flushing. If installed for this purpose, such an edge should be not less than 1 foot wide and at least 6 inches high in order that danger of accidental tripping may be reduced as much as possible.

D. High, tight walls should encircle the pool outside the runways. Some outdoor pools have been constructed with areas of sand or grass and shrubbery just outside the runways. This practice is objectionable as it leads to tracking of much dirt into the pool. Trees and shrubbery overhanging or adjacent to the pool or runways are also objectionable and may cause unnecessary dirt in the pool.

XI. Visitors' Galleries

There must be an absolute separation of the space used by spectators and that used by bathers. There should be no means by which bathers can enter space reserved for spectators or vice versa. Visitors' quarters must have a separate entrance. Galleries for spectators should not overhang any portion of the pool surface. Floor and foot rail of the gallery should be of tight construction to prevent dirt tracked in from getting into the pool. Gallery floor should slope to a drain and should be flushed down with hose regularly. Seats in galleries should be of non-absorbent construction to permit washing.

XII. Dressing Rooms

A. Bath houses to be used simultaneously by both men and women should have two parts, one for each sex, entirely separated by tight partitions.

B. Floors of all dressing rooms and locker rooms should be of smooth finished material, impervious to moisture, with no open cracks or joints. All floors should have a pitch of about ¼ inch to the foot and should slope to a proper drain to permit washing down with a hose. All junction of the floors with side walls and partitions should be finished with rounded joints.

C. Walls and partitions of all dressing rooms and locker rooms should be of smooth, impervious material, without open cracks or joints. If walls of wood or similar material are used, all cracks and joints should be filled and the surface kept finished with paint or other sanitary waterproof coating. Partitions between dressing compartments should terminate not less than 4 inches above the floor to permit flushing of the entire floor area.

D. All furniture used in dressing rooms should be of simple character and of easily washable material. Lockers where provided should be of vermin proof construction with tight joints. All lockers should be properly ventilated.

E. All dressing rooms and appurtenances must be kept clean at all times. The use of a vermifuge spray for lockers and of a disinfectant on floors, walls and seats at frequent intervals is recommended. Foot tubs in dressing rooms at beach houses should be prohibited.

XIII. Showers, Toilets, Lavatories

A. Adequate shower bath facilities with hot and cold water must be provided at all artificial pools. The minimum number of showers provided should be in the proportion of one for each 40 bathers expected at time of maximum load. At pools where mixed bathing is permitted it can usually be assumed that two-thirds of bathers at time of maximum load will be men.

B. Shower baths should be of such design that a proper mixture of hot and cold water may be obtained without danger of scalding the bather. A Bidet or upward flow spray beneath each shower to permit washing between the legs is desirable.

C. A foot trough with running water is desirable at entrance to outdoor pools and to beach bath houses. At certain pools operated in conjunction with surf bathing, it has been found advisable to make a wading pool of the entrance passage with automatic or continuous flow showers overhead, through which all bathers must pass on return to the pool.

D. At public bathing beaches a sufficient number of showers should be provided to permit all bathers to rinse off sand and dirt before entering the dressing rooms.

E. Adequate and proper toilet facilities for each sex must be provided at all pools and beach bath houses. The minimum number should be one toilet for each 40 women and one toilet and one urinal for each 60 men. Urinals should be of a type that will not cause splashing of urine upon legs and feet of bathers.

F. Water flush toilets should be used wherever possible. Chemical closets may be used if proper sewage disposal is lacking. All closets and urinals must be properly serviced. Privies of any type are not recommended for public bathing places.

G. Lavatories located adjacent to toilets should be provided at all swimming pools in the proportion of one bowl to each 60 persons using the pool at time of maximum load.

XIV. Lighting, Ventilation, Heating

A. A complete system of artificial lighting must be provided for all pools, bathing beaches, bath houses and dressing rooms which are to be used at night.

B. Lighting fixtures must be of such number and design as to light all parts of the swimming pool and the water therein.

C. Arrangement and design of lights must be such that life guards may see clearly every part of the bathing waters at a beach or pool, and all spring boards, towers, floats, and other appurtenances, without being blinded by the light.

D. Indoor pools should be so located that they may be lighted during the day by windows on at least one side or by skylight. The window or skylight area should not be less than one-half the area of the pool including the runways.

E. All indoor pools and all bath houses, dressing rooms, shower rooms and toilets at both indoor and outdoor pools and beaches, must be properly ventilated. Ventilation of indoor pool rooms must be so designed that direct draft will not blow on bathers.

F. At all indoor pools except those so located that outside temperature never falls below 60° F. the pool room and all dressing rooms, shower rooms and toilets should be artificially heated to a temperature of between 70° F. and 75° F. Thermostatic control of the temperature of the air in the pool room and of the water in the pool is desirable.

XV. Recirculation System

A. *The System:* The recirculation system consists of the pumps, haircatcher, and filters together with all necessary pipe connections to the inlets and outlets of the pool. The water heater, the chlorin-

ator and the suction cleaner are also usually installed on or connected with the recirculation system and may be considered as integral parts thereof. This entire system and all its component parts should be designed to provide the required volume of recirculation water as specified in section XVI, G, with a minimum of frictional resistance. Filtration and disinfection are discussed separately in subsequent chapters. The requirements for other parts of this system are as follows:

B. *Pumps:* Centrifugal pumps are preferable for swimming pool circulation, although plunger pumps are sometimes used. Electric drive is also preferable. When pipe lines from suction cleaner lead to pump suction, a pump which will develop good vacuum must be used. When pressure filters are used pumps must be designed to pass the required volume under the maximum head which may develop in the filters. When designed to operate with multiple unit filters it is advisable to have pumps in duplicate with proper cross connections to permit one filter to be washed with the effluent from another. If filters are located at an elevation higher than the water line of the pool a check valve must be placed on the pump suction.

C. *Hair Catcher:* The recirculation system should include a strainer to prevent hair, lint, etc., from reaching the filters. The best type of hair catcher consists of a metal chamber containing a removable cylindrical strainer, so arranged that the water passes through the strainer from the outside. The strainer should be of non-corrosive material with openings not more than 1/32 inch across. A slotted strainer is more easily cleaned than one which is perforated. The area of strainer openings should be at least ten times the area of the water inlets. Hair traps should be so constructed that they can be quickly taken down for cleaning by loosening two or three wing-nuts. Proper valves should be provided to prevent flow of water through the strainer while cleaning.

D. *Water Heater:* In northern climates some method of heating the water is essential for indoor pools. Blowing steam directly into the pool as is practiced in some instances or heating coils placed directly in the pool are not recommended. A heater designed to heat all or a part of the circulation water is preferable. In designing a heater, ample surface for heat interchange must be provided. Such a heater may be designed for use with steam or hot water. Automatic thermal control is desirable. Provision should be made for easy removal of the heater parts for cleaning.

E. *Suction Cleaner:* In the opinion of the committee the only satisfactory method of removing the dirt, hair, etc., settling on the bottom of a pool is by means of a suction cleaner. As such cleaners are commonly operated by the circulation pumps, they may be classed as an adjunct to the recirculation system. When a suction cleaner is to be operated by the recirculation pump, a gate with graduated stem or other registering device should be provided for throttling the flow from the pool outlet to permit the pump to operate at maximum efficiency when the suction cleaner is in use. Fixed pipe connections for attachment of suction cleaner to pump suction should be of ample size to reduce friction to a minimum and the cleaner and all removable connections should be designed to provide a maximum velocity at the suction nozzle.

F. *Piping System:* The piping system should be properly designed to reduce friction losses to a minimum. Pipe capacities should generally be at least double the theoretical value. Flange joints or unions should be inserted at intervals to permit any part of the system to be quickly taken down for cleaning or repairs. A sump and blow-off should be provided at the lowest part of the system to permit removal of any accumulating iron rust. Openings should be provided for insertion of gauges to permit vacuum on pump suction and pressure at discharge to be determined, should a study

of the recirculation system be desirable. It is advisable also to make provision for insertion of Pitot tubes or meters for checking the actual volume of water passing through the system under working conditions. Outlets should be provided for obtaining samples of the water as it leaves the pool and after filtration for purposes of laborator tests. Other requirements for piping are discussed under the heading "Inlets and Outlets."

G. *Testing the System:* After the recirculation system has been installed and the various units tuned up, a test of the hydraulic properties of the entire system and of each integral unit should be made. In such a test the velocity in the piping system at various points, the discharge capacity of each filter and each pump, the velocity and volume of wash water in each filter, and the rate of discharge at each pool inlet should be determined under actual working conditions with the pool at normal working level. The full data of this test should be a matter of permanent record for future comparison. A similar test repeated at least once a year is desirable.

XVI. Proportioning the Water Interchange for Recirculation and Flowing Through Pools

A. In a recirculation or flowing through pool in which the dirty or used water is continually being withdrawn and replaced by fresh or filtered water, purification of the pool water proceeds by consecutive dilution. The first portion withdrawn from the pool will all be dirty water but, owing to the constant admixture of entering clean water with the dirty water remaining in the pool, each succeeding portion of water withdrawn will consist of a decreasing proportion of dirty water mixed with an increasing proportion of clean water. In proportioning the rate at which fresh water should be added to a flowing through pool, or the capacity of pumps, filters, etc., for a recirculation pool, this law must be taken into consideration.

B. Gage and Bidwell have recently worked out the law of purfication by consecutive dilution as applied to recirculation and flowing through pools. The following abstract of a paper in preparation has been arranged by the authors for this report:

It is proposed that the rate of water interchange in a recirculation or flowing through pool be expressed as the ratio of the volume of clean water entering the pool in 24 hours to the total pool volume. For convenience this ratio may be called the "Turnover" rate or "T" of the pool purification system. For example, $T=1$ when the volume of water recirculated in 24 hours is the same as the pool volume, $T=2$ when the water circulated in 24 hours is twice the pool volume, etc.

It can readily be demonstrated by computation and by experiment that 7 turnovers are required to effect a removal of 99.9 per cent of the dirt present in the water of the pool when recirculation was started. At the end of the first turnover the purification will be about 63 per cent, after two turnovers about 86 per cent, at the end of three turnovers about 95 per cent, after four turnovers about 98 per cent, after five turnovers 99.3 per cent, and after six turnovers 99.7 per cent. To accomplish a purification of 99.99 per cent 10 turnovers will be required.

If the pool is used regularly by bathers further increments of dirt will be introduced into the water daily, and the removal of each successive daily increment will proceed according to the law. The result of the addition of such daily increments will be an increasing accumulation of dirt in the water up to a certain point, after which the dirt content of the pool water will remain practically constant, subject only to the fluctuations caused by the variations in the daily bathing load. The amount of this accumulation and the time required for the pool water to reach a condition of equilibrium depend upon the rate of turnover of the pool by the flowing through or by the recirculation system, and in the latter system is also dependent upon the efficiency of the filters.

Assuming a daily increment of dirt equal to that in the pool at the start and a filter efficiency of 100 per cent, with a daily turnover ($T=1$) equilibrium will be reached at the end of the ninth day when the accumulated dirt in the pool will be equivalent to about 58 per cent of the amount present when recirculation and daily bathing was started. With two turnovers per day ($T=2$) equilibrium will be obtained in four days with a dirt load of about 16 per cent, with $T=3$ a balanced load of about 5 per cent will be obtained on the third day and with $T=4$ a balanced load of about 2 per cent will be obtained at the end of the second day. On the other hand, if the recirculation system is so small that it requires two days for each turnover, accumulation of dirt in the pool will con-

tinue for about nineteen days and the dirt load carried in the pool thereafter will be about 155 per cent of the amount present at the start.

It is evident, therefore, that if clean water is to be maintained, the recirculation or flowing through system must be designed to provide a turnover ratio of at least two and that where heavy bathing loads are anticipated, the turnover ratio should be three or more. It is also evident that the recirculation or flowing through system should be kept in operation continuously and that the filters should be operated in the most efficient manner. If the filters have an efficiency of only 50 per cent, or the recirculation system is operated only half the time, the effect will be the same as though the recirculation system were only half the size.

XVII. Filtration

A. Slow sand filters, rapid gravity filters and pressure filters have all been used in swimming pool repurification systems. More than 80 per cent of the recirculation pools in this country are equipped with pressure filters and for indoor pools and small pools where space is limited, this type of filter is to be preferred unless the water is very hard. For large outdoor pools the gravity type rapid filter is suitable and is preferred by some sanitary authorities. Where the water is very hard and cementation of the filter medium is likely to occur the open type of filter is to be preferred. Because of the large amount of space required, and the increased amount of hand labor required in cleaning, slow sand filters are seldom used for swimming pools.

B. Batteries of two or more filters arranged in parallel are preferable to a single unit, in order to permit continuation of filtration and recirculation while one unit is out of operation for cleaning or repairs.

C. Filtering material should consist of at least 36 inches in depth of suitable grades of screened sharp filter sand or crushed quartz and filter gravel. There should be at least 18 inches of freeboard above the surface of the filter material to the overflow troughs or pipes of rapid filters to permit proper washing without loss of filter sand. In some cases filters of bone charcoal, wood charcoal, or similar material have been installed on swimming pool recirculation systems. When new these materials may have considerable absorptive effect, but after a few weeks' use this power is lost and the filter becomes practically worthless until the filter medium is renewed.

D. In designing a filter system for a swimming pool the rate of slow sand filters should not exceed three million gallons per acre per day, and the rate of rapid filters should not exceed three gallons per minute per square foot of surface area. Automatic rate controllers are essential on slow sand filters. Rate controllers are not usually installed on the rapid filters used for small swimming pools because of the considerable increase in cost. Filters for large pools (100,000 gallons or more) should be equipped with rate controllers and such control is desirable on smaller installations.

E. Rapid filters of open gravity type must be equipped with loss of head gauges. Pressure filters must be equipped with pressure gauges on the inlet pipe and the outlet pipe for determination of loss of head or back pressure in the filter medium. Pressure filters should have a proper sight glass installed on the waste discharge pipe by which the operator may watch the progress of filter washing. Such glass should be readily removable for cleaning. When pressure filters are located at an elevation above the water line of the pool each filter must be equipped with an automatic air relief valve. The arrangement and number of valves and interconnecting piping, or "valve nest," for necessary and convenient operation of rapid filters is fairly well standardized, and a discussion thereof may be omitted.

F. Readily removable heads or a large manhole should be provided on pressure filters to facilitate inspection and repairs. Sufficient head room and working space must be allowed about filter units of all types to permit sand replacement and other repairs when necessary.

G. If the water supply contains iron, manganese, turbidity, or any appreciable amount of color, treatment with alum or

other coagulant will be necessary with slow sand filters as well as with filters of the rapid flow type. On filters for pools of more than 50,000 gallons capacity, solution tanks and orifice boxes are to be preferred to the "Alum Pot," so-called, which is usually installed for use with small filters.

H. When the water supply for a pool contains large quantities of calcium bicarbonates, and especially when such water must be heated for use, difficulty is often experienced in maintaining clear water in the pool by the usual methods of coagulation and filtration. To a certain extent this difficulty may be overcome by passing the alum-treated water through a properly designed coagulation and sedimentation basin before filtration. Where the installation of a proper coagulation basin is impracticable it is suggested that water softening apparatus of the zeolite or base exchange type be installed as an adjunct to the recirculation system to permit the calcium content of the pool water to be reduced to a reasonable amount.

XVIII. Disinfection

A. From all available information the addition of chlorine either as a gas or as a water solution by use of proper apparatus is to-day the most satisfactory method of pool disinfection. It is possible not only to completely disinfect the entire body of water in the pool with chlorine, but also maintain in the pool water at all times a residual amount of disinfectant to sterilize immediately any dangerous pollution disseminated by bathers. With the proper chlorine apparatus it is also possible to increase or diminish the dosage as required to compensate for variations in the bathing load. The committee recommends the use of chlorine either as a gas or as a water solution for disinfection of all pools where there is any appreciable bathing load or where bathing suits are worn.

B. A possible objection to the use of chlorine for indoor pools is the chance of accidental escape of gas into the room. Modern chlorine apparatus is carefully designed and built to prevent possibility of such accidents. As a factor of safety it is advisable to install the chlorinator and tanks in a special closet with vents near the floor connecting with a chimney or other duct leading outside the building.

C. Next to treatment with chlorine as gas or water solution, continuous application of a solution of hypochlorite of lime or hypochlorite of soda is the most effective method of swimming pool disinfection. It is sometimes difficult to handle and apply these chemicals without escape of some objectionable odor into the room. When open to the air these chemicals also change rapidly in chlorine content and frequent tests of the strength of solution being applied and readjustments of the rate of application, as well as frequent tests of the residual chlorine in the pool water, must be made when this method of disinfection is used.

D. Intermittent disinfection with hypochlorites as practiced at many pools must be considered a makeshift. It is possible to obtain satisfactory disinfection by intermittent application of these chemicals and to maintain a satisfactory residual chlorine content in the water when the bathing load is constant and not too high. When the bathing load fluctuates widely the residual chlorine content cannot be adjusted to compensate for these variations, and under excess loads immediate disinfection of infectious matters from bathers may not be accomplished.

E. Sterilization of clear water may be obtained by exposure in thin films to ultra-violet rays. This sterilizing action is confined entirely to the period of such exposure and no residual disinfecting action is carried over into the pool. Disinfection, therefore, proceeds according to the law of purification by consecutive dilution and is subject to the limitations imposed by that law. There is never any disinfectant in the pool water to act on infectious material which may be discharged by bathers during the bathing

period at the time when such material is most dangerous. In a few cases satisfactory control of the bacterial content of pool water has been reported by the use of ultra-violet disinfection alone. In a considerable number of instances, however, it has been found necessary to reinforce or supplement the ultra-violet treatment by treatment with chlorine or hypochlorites. On the basis of any available evidence the committee cannot recommend the use of ultra-violet ray apparatus alone for disinfection of any pool where the bathing load is high or where large temporary loads are likely to occur.

F. Judging from a few reports, a reasonably satisfactory disinfection of water may be accomplished by ozone when the necessary apparatus is properly installed and operated. The data on the use of ozone for swimming pool disinfection are very few and inconclusive. There is no evidence that ozone has any residual sterilizing effect after the water has been treated, and disinfection must, therefore, proceed according to the law of consecutive dilution and be subject to all limitations imposed by that law. On the basis of any available evidence, the committee cannot recommend this method for swimming pool disinfection.

G. The committee recommends the use of copper sulphate in combination with either of the approved methods of disinfection at such times and in such amounts as may be necessary to control growths of algae in swimming pools and other bathing waters. The use of copper salts alone as a disinfectant will not produce satisfactory bacterial control and cannot be recommended.

XIX. Diving Towers, Spring Boards and Floats

A. Diving towers, when provided, shall be rigidly constructed and properly anchored to the bottom with sufficient bracing to insure stability under the heaviest possible load.

B. Fixed platforms and floats in the water shall be constructed with an air space of at least 1 foot beneath. There must be as little under water construction in such platforms as is consistent with strength, and all braces, struts, etc., shall be designed to prevent entanglement or trapping of bathers beneath the platform.

C. At least 12 feet free and unobstructed head room must be provided above diving boards and towers.

D. No diving board or platform more than 10 feet above water level should be permitted at any public place. The elevation of diving boards or towers should not exceed the safe limit for the average swimmer. The consensus of opinion of swimming instructors, etc., as summarized in the Fifth Report of this committee apparently establishes the following as the minimum safe depth of water for diving from various elevations:

Elevation of Diving Platform	*Minimum Safe Depth of Water*
1 foot	5 feet
3 feet	6 feet
5 feet	7 feet
7 feet	8 feet
10 feet	9 feet

XX. Emergency Equipment

A. Pole hooks, ropes, buoys, and other necessary life saving equipment must be provided and be readily accessible at all pools and bathing beaches.

B. A first aid kit containing aromatic ammonia, tincture of iodine, sterile gauze, absorbent cotton, surgeons' plaster, and bandages of various widths should be provided for emergency use at all public bathing places.

XXI. Suits, Towels and Caps

A. At indoor pools used exclusively by men, nude bathing should be required. At indoor pools used exclusively by women bathing suits should be of the simplest type. Suits when used should be of wool or cotton of simple design and of undyed material or tested for fastness of color. Elaborate suits of varied materials or varied colors should not be permitted.

B. At artificial pools all bathers of both sexes should be required to wear rubber bathing caps.

C. It is desirable at artificial pools that all suits and towels be supplied and cared for by the management. If individually owned suits are permitted, they should be of prescribed style and material and should be laundered and stored at the pool by the management.

D. All suits and towels must be washed with soap and boiling water, rinsed, and thoroughly dried each time they are used.

E. Unless suits and towels are sent to a public laundry, the installation and use of modern laundry equipment at all public bath houses and pools should be required. Cold water washing and air drying should be prohibited. The use of a disinfectant on suits and towels in place of proper laundry methods is a makeshift which should not be permitted.

F. A sufficient number of suits and towels should be provided to take care of the maximum number of bathers. Unless thoroughly dried by artificial heat in a modern laundry drier, suits and towels should not be re-issued on the same day that they have been used.

G. Clean suits and towels must be kept strictly separated from those which have been used and unlaundered. Clean suits and towels must not be stored on shelves, handled in baskets or passed out over counters where dirty suits have been.

XXII. Supervision of Bathers

A. A swimming instructor, bathing master or other qualified attendant should be on duty at the pool side at all times when a pool is open to use by bathers. Such attendant should be in full charge of bathing and have authority to enforce all rules of safety and sanitation.

B. An attendant should be on duty at the shower room or entrance to the pool to inspect all bathers for skin diseases, open lesions, etc., and to insure that a proper cleansing bath has been taken.

C. At public bathing beaches one or more life guards should be on duty during all bathing hours.

D. Swimming pool attendants and life guards should be capable swimmers, competent in life saving methods and in methods of artificial resuscitation.

E. No bather should be permitted to enter the pool room or pool enclosure, unless an attendant or other competent person is present. Solo bathing must be absolutely prohibited at all pools.

F. Whenever a pool is empty, entrance of all persons except pool attendants must be effectually prevented.

XXIII. Personal Regulations

A. All persons using a swimming pool must be required to take a cleansing shower bath in the nude, using warm water and soap, and thoroughly rinsing off all soap suds, before entering the pool room or enclosure. A bath after donning a bathing suit should not be permitted.

B. A bather leaving the pool room or enclosure for any reason should take a foot bath before returning. A bather leaving pool to use toilet should be required to take a second cleansing bath before returning.

C. All bathers should be instructed to use the toilet and particularly to empty the bladder before taking cleansing bath and entering the pool.

D. Any person having any skin disease, sore or inflamed eyes, cold, nasal or ear discharges, or any communicable disease must be excluded from a public swimming pool.

E. Persons having any considerable area of exposed sub-epidermal tissue, open blisters, cuts, etc., should be warned that these are likely to become infected and advised not to use the pool.

F. Spitting, spouting of water, blowing the nose, etc., in the pool should be strictly prohibited. Bathers should be instructed that the scum gutter is provided for expectoration.

G. All bathers should be instructed that blowing the nose to remove water is likely to force infectious matter into sinus and inner ear cavities and possibly cause serious consequences.

H. Divers should be advised to wear rubber caps over the ears or to plug the

ears with greased cotton to prevent infection of the ear drum and passages by water forced in by concussion.

I. No boisterous or rough play, except supervised water sports should be permitted in the pool, on the runways, diving boards, floats, platforms, or in dressing rooms, shower rooms, etc.

J. Suitable placards embodying the above personal regulations and instructions and those relating to suits and towels should be conspicuously posted in the pool room or enclosure and in the dressing rooms and offices at all swimming pools. At a number of boys' club pools the boys are required to memorize the rules for safety and sanitation as a prerequisite to use of the pool.

XXIV. Chemical and Physical Quality of Swimming Pool Water

A. *Excess Chlorine:* Whenever chlorine, calcium hypochlorite or other chlorine compounds are used for swimming pool disinfection, the amount of available or excess chlorine in the water at all times when the pool is in use shall not be less than 0.1 p.p.m. nor more than 0.5 p.p.m.

B. *Acidity-Alkalinity:* Whenever alum or sulfate of alumina is used during purification or repurification of swimming pool waters the water at all times when the pool is in use shall show an alkaline reaction.

C. *Clearness:* At all times when the pool is in use the water shall be sufficiently clear to permit a black disk 6 inches in diameter on a white field, when placed on the bottom of the pool at the deepest point, to be clearly visible from the side walks of the pool at all distances up to 10 yards measured from a line drawn across the pool through said disk.

D. *Temperatures:* The water in any swimming pool should not be artificially heated to a temperature above 72° F. The temperature of the air at any artificially heated swimming pool must not be permitted to become more than 8° F. warmer nor more than 2° F. colder than the water in the pool at any time when the pool is in use. For best results it is desirable that air temperatures shall be about 5° F. warmer than the pool temperature.

XXV. Bacterial Quality of Swimming Pool Waters

A. *Bacteria Count on Agar—2 Days—20° C.* (This count is optional): Not more than 10 per cent of samples covering any considerable period shall contain more than 100 bacteria per c.c. No single sample shall contain more than 200 bacteria per c.c.

B. *Bacteria Count on Agar or Litmus Lactose Agar—24 Hours—37° C.:* Not more than 10 per cent of samples covering any considerable period shall contain more than 1000 bacteria per c.c. No single sample contain more than 5000 bacteria per c.c.

C. *B. Coli—Presumptive Test:* Not more than two out of five samples collected on the same day, not more than three out of any ten consecutive samples collected on different dates shall show a positive presumptive test.

XXVI. Cleaning Pool

A. Visible dirt on the bottom of a swimming pool shall not be permitted to remain more than 24 hours.

B. Any visible scum or floating matters on the surface of a pool shall be removed within 24 hours by flushing or other effective means.

XXVII. Bathing Load Limits

A. *Frequency of Changing Water:* The total number of bathers using a swimming pool during any period of time shall not exceed 20 persons for each 1,000 gallons of clean water added to the pool during that period. The term "clean water" as used above may be interpreted to mean, new clean water used to refill the pool, new clean water used to replace loss by splashing or during cleaning, water taken from the pool and returned after effective filtration, or any combination of such waters.

B. *Frequency of Disinfection:* The total number of bathers permitted to use a swimming pool during any period of time shall not exceed 7 persons for each 1,000 gallons of water in the pool unless the pool shall have been completely disinfected at least once during that period. The term "completely disinfected" shall be interpreted to mean that the method of disinfection shall be such as to insure a bacterial quality of water as prescribed under section XXV of these standards.

XXVIII. Operating Control

A. *Trained Operators:* Each swimming pool should be operated under the close supervision of a well trained operator with common sense and good judgment.

B. *Tests for Excess Chlorine:* At any pool where chlorine, hypochlorite of lime or other chlorine compound is used for disinfection, the operator must be supplied with a proper outfit for making the ortho-tolidine test for excess chlorine and with permanent standards showing maximum and minimum permissible chlorine in the water. Tests for excess chlorine in the water must be made every day that the pool is in use.

C. *Tests for Acidity:* At any pool where alum or sulfate of alumina is used or where artificial alkalinity is added to the water the pool operator must be supplied with a proper outfit for testing for acidity and alkalinity and must make such tests on the water every day that the pool is in use.

D. *Operating Records:* Every pool operator must be supplied with a proper notebook or with blank forms on which shall be recorded every day the number of persons using the pool, the volume of new water added, the temperature of the water and the temperature of the air. Wherever a pool is used by both males and females the number of each and whether adults or children should also be recorded. At all pools where artificial circulation, filtration, or any chemical treatment is used, a full daily record must also be kept of the actual time pumps and filters are in operation, of the time each filter is washed or cleaned, of the time and amount of each chemical used or added, of the time the bottom and sides of pool are cleaned, and the results of all acidity, alkalinity, and excess chlorine tests.

STEPHEN DEM. GAGE,*† *Chairman*
HARRY F. FERGUSON*† E. S. TISDALE*†
C. G. GILLESPIE* JACK J. HINMAN, JR.†
RICHARD MESSER* HOWARD W. GREEN†

* Conference of State Sanitary Engineers.
† Public Health Engineering Section, A.P.H.A.

This report has been referred to the Council on Standards of the American Public Health Association. The standards herein recommended cannot be considered official standards of the American Public Health Association until approved by the Council on Standards and the Governing Council.

INDUSTRIAL HYGIENE ABROAD AND THE HYGIENIC EXPOSITION AT DÜSSELDORF*

GEORGE M. PRICE, M.D., Fellow A.P.H.A.

Director, Union Heath Center and the Joint Board of Sanitary Control, New York City

THE "GESOLEI" Düsseldorf Exhibition of Hygiene is a welcome symptom of the impending recovery of European countries in general and in industrial hygiene in particular.

Fifteen years ago most of the leading European countries were in advance of the United States in matters of industrial hygiene. At that time a number of them had complete systems of health and sickness insurance, good methods of accident prevention, compensation for accidents, advanced labor legislation and inspection, and they had made profound studies of occupational diseases, industrial poisons, etc. On the other hand, in the United States, at that time we had inadequate labor legislation, low standards and methods of enforcement, a practically total absence of industrial accident prevention and compensation, and a general lack of interest and knowledge of many problems of industrial hygiene.

During the last decade in the United States we have rapidly introduced compensation laws in nearly every state; we have improved our labor legislation and our methods of enforcement and factory inspection. Industrial hygiene has become an important subject in the curricula of many medical colleges and universities. Accident prevention has received an impetus that cannot be surpassed, while conspicuous work has been done by the various official labor and health departments as well as by special organizations, like the National Council of Safety, Industrial Conference Board and others.

During this same decade most of the European countries have regressed and lost their eminent standing in industrial hygiene, due, of course, to the war and post-war periods. While labor legislation has been advanced in some of the countries, enforcement has suffered a complete breakdown, the general industrial conditions have grown worse and worse, the value of the human factor has decreased, the number of hours of labor has increased, wages have decreased, the standard of living has declined, unemployment has increased, housing has become more wretched, child and woman labor much more frequent, and general industrial hygiene problems have been neglected.

Comparatively speaking, conditions are worse in Belgium, France, Italy, and, perhaps, Austria, but they are somewhat better in Czecho-Slovakia, Germany, and England.

INDUSTRIAL CLINIC IN MILAN

However, there are already signs of a potential recovery and a possible revival of interest in general hygienic conditions and in industrial hygiene. Professor Davoto's Industrial Clinic in Milan is an important nucleus for the study and propaganda of theoretical and practical industrial hygiene. Although this institution is small, having but 60 beds and no large ambulant clientele, the fact that it is partly supported by labor organizations and that it is a center of research of problems of industrial hygiene by Professor Davoto, and a place for training young medical practitioners in industrial hygiene, makes it an institution of great

* Read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-fifth Annual Meeting at Buffalo, N. Y., October 14, 1926.

importance. It can be pointed out as a splendid achievement in the land which furnished the pioneer of industrial hygiene, Ramazzini.

Much effective work is being done in many places in Germany and Austria as well as in England in theoretical studies of occupational diseases by men like Professor Lehman of Würtzburg, and Professor Teleky, and also by the various official commissions in England and Belgium.

REVIVAL OF INTEREST IN INDUSTRIAL HYGIENE

An important, if not the most important agent in the revival of industrial hygiene, is undoubtedly the International Labor Office at Geneva. Under its far-seeing and energetic director, Albert Thomas, with a staff of international experts and a large subsidy from various governments, the International Labor Office is making conspicuous progress in correlating all information, studying various phases, initiating special investigations, and, generally, serving as the most important impetus to the study of industrial hygiene problems and improvement of industrial conditions in all countries of the world, of course giving special emphasis to European problems.

Another barometric sign of the rise of interest in general hygiene and in industrial studies, is the "Gesolei" Exposition of Hygiene of 1926, which has been so courageously and successfully launched in Germany.

The three recent expositions in Europe—the British Wembley Exposition in 1924, the Decorative Art Exhibit in Paris in 1925, and the "Gesolei" (Gesundheit, Soziale Fürsorge and Leibesübungen) at Düsseldorf, Germany, this year represented three distinct and different aims. The British Wembley Exposition drew the attention of the world to the immense natural resources of her widespread empire; the Paris Decorative Art Exhibit endeavored to show the arts and crafts of a decadent civilization; but the Düsseldorf Exhibition touched the very fundamentals of national wealth, which is based upon standards of national health.

At the opening the sponsors of the "Gesolei" Exhibition explained its purpose:

"The basis of all social welfare is the health of the people. Upon health depends the productivity and the efficiency of the individual, of the people and of the whole nation. The working class and its working power is Germany's future *capital*. Only the healthy can work for Germany's future. The most mighty weapon in the fight against constitutional and other revolutions is the education of the people. Hence, the Düsseldorf "Gesolei" Exhibition, with its central idea of the highest aim of social welfare, based upon the education of the masses of the people and all classes of the nation."

Therefore, the purpose of the Düsseldorf Exhibition is to show the need for improved individual health, for better care of the community and for the creation of new standards of national health, and to emphasize the new interest in the human factor, so long neglected during and after the war.

In size the Düsseldorf Hygiene Exhibition surpassed the exhibits at London and Paris. The 173 buildings of the exposition cover almost 2 miles of territory. This huge area, so tastefully decorated and filled with the large number of buildings, successively showing various phases of human and social culture and welfare, presents indeed a kaleidoscopic perspective, pleasing to the eye, instructive to the mind and full of lessons for individual and social life. The keynote of the whole exhibition is, "Prevention is Better than Cure."

The great mass of material presented in the exhibit is classified in three main divisions—Health, Social Welfare, and Physical Exercise. Only the chief groups of subdivisions of these three main divisions can be here mentioned:

Health
- Man, with a special demonstration, "The Transparent Man"
- Heredity and Eugenics
- Air and Climate
- Nutrition
- Man in His Health Relations to Plants and Animals
- Housing and Colonization
- Clothing and Personal Hygiene
- Care and Treatment of the Sick
- Contagious Diseases
- Colonial Hygiene
- Workers and Industrial Hygiene; Accident Prevention
- Sanitary Service of the German Army and Navy in the World War

Social Welfare
- Foundation and Structure of Social Welfare
- Health Welfare
- Cultural and Educational Welfare
- Economical Welfare
- Welfare Through Insurance
- Review of the Official and Private Welfare Activities

Physical Exercsie
- General
  - History of Gymnastics in Science, Art, School and Life
  - Medical Knowledge Applied to Gymnastics
  - Gymnastics in School
  - Installations for the Developing of Gymnastics
  - Sport and First Aid
  - Sport and Art
- Application of Gymnastics
  - Gymnasia
  - Light Athletics
  - Heavy Athletics
  - Boxing
  - Fencing

While the "Gesolei" Exhibition has a national character—the only other country participating in it being Austria—the visitors, of course, have come from all over the world. However, the bulk of the attendance has been German. Special efforts were made to popularize the Hygiene Exposition and the attendance has been very large, on some days exceeding 150,000 persons. Large groups of children and students, under the guidance of competent instructors, daily visit the maze of interesting and beautiful exhibits. Commercial exhibits, while present, are not prominent and seem to be but a part of the general exhibit.

A very large number of workers have attended the exhibit in spite of the one and a half marks (36c) entrance fee, and about a thousand conferences on various hygienic subjects were held on the exhibition grounds during the summer.

The eleventh group, embracing "Industrial Hygiene," has been divided into the following sub-groups:

- Legislative Basis for Protection of Workers
- Industrial Physiology
- Industrial Psychology
- Accident Prevention
- Occupational Diseases
- Homework, and Work of Women and Children

Under all these groups the best subjects and objects from the various industrial museums of Germany have been gathered and many new methods of demonstration are presented.

Especially rich is the Occupational Disease Group, with models of practically all the occupational diseases and their etiology and prevention.

This birdseye view of the Düsseldorf Hygiene Exhibition gives but a brief and superficial idea of its wealth and significance. Its educational value will reach far beyond the borders of Germany. It will react favorably on the development of hygienic knowledge in other European countries, and it is hoped that it may soon be imported, transplanted, and adopted in this country.

THE RELATION OF DAIRY PRODUCTS TO HEALTH THROUGH NUTRITION*

IN A RECENT discussion of the fact that most American communities do not yet consume as much milk as is needed for the best results in health, Dr. Haven Emerson[1] has summarized the results of his extensive studies in part as follows:

"Present information as to cost and value makes it quite clear that the entire community would save expense and serve their nutritional needs best if as much as one quart of whole milk were used as food for each member of the population daily. We can go further and say that it is indispensable to steady growth and development of children at least until they reach school age that a quart of milk should enter their daily dietary. We can add a third summary of the situation to the effect that unless at least a pint of milk a day per person is used in a community, waste of income and serious nutritional errors are certain to develop and affect the vitality, sturdiness, and capacity to resist disease, of a large number of both children and adults. The above statement of an optimum per capita use of milk of one quart for each child under six years of age and not less than one pint for the remainder of the population, is not based upon any single social, economic, chemical, or physiological test, study or experiment, but represents the sum of observations in many relief agencies, budgetary studies of families under nursing and dietitian care, taken together with the experience of physicians and of medical services in hospitals, and the exact records of camps, institutions for children and adults, etc. This general conclusion can readily be verified by anyone with a fancy for figures who calculates the essential and accessory food qualities and contents of milk and its effect in causing and maintaining good nutrition, growth, and development when used as suggested."

PRESENT MILK CONSUMPTION INSUFFICIENT

His carefully compiled statistics of the milk supplies of American cities show that the present rate of milk consumption (in cities) is only about half sufficient to meet the requirements of his suggested "safe minimum standard" and he recommends that health officers endeavor to increase the per capita milk consumption, saying: "A definite policy and the prosecution of a vigorous program of education by the health officers of the country would go far to encourage milk consumption to such an extent that reduction of various nutritional disturbances of children and adults would ensue."

McCollum and Simmonds[2] state that: "The researches in the field of nutrition have a greater value in preventive medicine in relation to raising the vitality of mankind, with all that this implies, than they have in the prevention of the occurrence of deficiency diseases. It is the gradual operation of more or less constant but unperceived causes . . . which in most cases are responsible for undermining the health of the individual. Of these causes it now seems certain that the consumption of an improperly constituted diet is one of the most important. It is one of the causes of inferiority in physical development, instability of the nervous system, lack of recuperative power and endurance and consequent cumulative

* Report of the Committee on Nutritional Problems read at the special session on Milk at the Fifty-fifth Annual Meeting of the American Public Health Association at Buffalo, N. Y., October 14, 1926.

fatigue, and lack of resistance to infections such as tuberculosis and other types where specific immunity is not easily developed in the body. . . . The system of diet which can be confidently recommended with assurance that it will go a long way toward improving the physical fitness of the nation . . involves the borrowing of the best elements from those several systems of diet which have been thoroughly tested in human experience and have been found successful. The first and most important principle is the extension of the use of dairy products."

The *Journal of the American Medical Association* editorially approves the recommendation, "based on dependable physiologic information," of "a quart of milk a day for every child, a pint for every adult" and recognizing that this calls for increased production, finds in the studies of J. R. Smith[3] adequate assurance that the normal and inevitable intensification of agriculture can provide for almost unlimited expansion of the dairy industry without any serious reduction of the supply of any other food. "These figures will suffice to lend some assurance that there still is abundant occasion to increase the use of milk, and large opportunity for the promotion of public health policies in this direction."

QUART OF MILK DAILY FOR GROWING CHILDREN

Extended and painstaking experimental work under the joint auspices of Columbia University and the New York Association for Improving the Condition of the Poor[4] showed that the full allowance of a quart of milk per day is necessary to insure the optimum development of growing children up to at least the age of 13 years. Thus, for the period of active growth and development of the body we have direct and convincing evidence from well controlled investigation of the children themselves.

For adults the *direct* evidence is less completely conclusive, as is natural because in human experience so many factors may enter to influence health in the course of a lifetime that it is hard to separate and measure the effects of food alone upon the whole duration and healthfulness of life. But precisely this has been done with suitably selected laboratory animals (albino rats), and by an extended quantitative comparison of parallel groups of (rat) families of like inheritance and living under precisely the same conditions in all other respects, it was found that, starting with a diet already adequate, an increase in the proportion of milk in the food supply plainly resulted in a higher degree of health and an increased ability to resist disease.[5] Statistical analysis of the data of large numbers of cases shows clearly that the improvements in health were certainly due to the increased proportion of the milk in the diet—that they can not have been accidental, due to chance or physiological variability of the animals. And all of the improvements in health and vitality were even more clearly marked in the second generation than in the first. Thus a higher milk consumption makes for a higher degree of health both in the present generation and in their offspring.

Similar investigations with laboratory animals have further shown that both the high calcium content of the milk and its richness in vitamin A are factors in bringing about the improvements in nutrition and health which plainly resulted from an increase in the proportion of milk in a food supply which was already adequate according to current standards.

Thus, it was found that the increased calcium intake induced an improvement in the development of the bones beyond that obtainable by enrichment of the diet in fat-soluble vitamins alone; but also that the increased allowance of fat-soluble vitamin A has a very pronounced effect both upon general vitality and upon

the ability to resist definite infectious diseases — conspicuously those of the respiratory tract.[6]

Inasmuch as the evidence now available shows so plainly that vitamin A, in quantities larger than are needed to support growth and prevent deficiency disease, is an important factor in health in that it increases the ability of the body to resist infectious diseases, the supply of butter as well as of milk becomes a matter of importance to health through nutrition. Obviously, however, whole milk contains everything which butter contains and much else of high nutritive value. Moreover, the skim-milk and buttermilk of the butter industry are not always fully used as human food. Therefore, it seems more important to increase the consumption of whole milk than that of butter or cream.

INCREASED CONSUMPTION OF MILK RECOMMENDED

Your committee feels that very special emphasis should be laid upon the fact that the best interests of the public health demand that the activities of health authorities in connection with milk problems shall be such as to lead to increased milk consumption. This means that we should seek to simplify, rather than elaborate, the requirements governing milk production, so that the real essentials may be effectively emphasized. And it also means that the requirements of pasteurization should call for no more heat treatment than is really required to render the milk safe both in order that the reduction of vitamin value in pasteurization (although we believe it to be but slight) shall be minimized as far as possible, and in order to avoid any change in appearance or flavor which might make the milk less acceptable to the consumer and thus diminish milk consumption.

In recent years, the center of gravity of the problem of the relation of food to health has shifted from sanitation to nutrition, and, realizing this, the progressive health worker of to-day seeks to encourage the liberal production and consumption of those foods the increased use of which has been shown to be of great importance in the promotion of health and vitality.

H. C. SHERMAN, *Chairman*
C.-E. A. WINSLOW
E. L. FISK
ISADOR GREENWALD
T. P. B. JONES

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NEW YORK'S NEW MODEL HEALTH CENTER

The dedication and presentation of the Bellevue-Yorkville Health Building to the Community Health Council of New York City by the Milbank Memorial Fund, on November 30, marked another significant step in the public health progress of the Metropolis. This five-story building in the heart of one of New York's most congested districts has been remodeled and equipped at a cost of one-quarter million dollars, to house all features of the health center of the Bellevue-Yorkville Health Demonstration, including model clinics, consultation rooms and offices of several of the 56 coöperating social and health agencies.

Statistics explain the selection of this East Side district for the site of the model health center. During 1922–24 the general death rate in New York City was 11.8 per 1,000, and for infants it was 70 per 1,000 births, while in this particular section the general death rate was 16.5 per 1,000 and for infants 94 per 1,000 births.

Edward W. Sheldon, president of the Milbank Memorial Fund, made the formal presentation of the building.

THE PREPARATION AND TESTING OF DIPHTHERIA TOXOID (ANATOXINE-RAMON)*

P. J. MOLONEY, PH.D.

Connaught Laboratories, University of Toronto, Toronto, Ont.

IN A SERIES of papers, the first of which appeared in 1923, Ramon has emphasized the fact that diphtheria toxin may be rendered atoxic by the action of formalin† and heat; and further that this non-toxic product retains in a high degree its antigenic properties. This new diphtheria antigen has been called anatoxine by Ramon. In England and America the word toxoid is used as synonymous with the word anatoxine. Diphtheria toxoid appears to offer certain advantages as an immunizing agent against diphtheria, over toxin-antitoxin which has been used heretofore. First, as tested on guinea pigs, diphtheria toxoid is wholly non-toxic, whereas toxin-antitoxin is somewhat toxic; and secondly, since toxoid contains no serum its use as an antigen cannot bring about serum sensitiveness. However, the relative merits of the two products have not yet been finally determined.

The method for the preparation of diphtheria toxoid as carried out at the Connaught Laboratories is a modification of the method recommended by Ramon. First, it is essential to obtain a good toxin. This is done in the ordinary way by cultivating the diphtheria bacillus in veal infusion broth. About the seventh day after seeding, the broth culture is clarified by filtration through paper pulp and sterilized by Berkefelding. The M.L.D. and flocculating value of the toxin are then determined. From the flocculating value one can usually predict the probable usefulness of a toxin. However, the M.L.D. is the criterion on which we depend. A toxin which contains less than 400 M.L.D.'s per c.c. is not used for toxoid production. Formalin is added to the toxin to a concentration of 0.3 per cent, *i.e.*, 3 c.c. of 40 per cent formaldehyde solution to each liter.‡ No phenol, cresol,[1] or other preservative is added.** The mixture is then heated at 37° C. until detoxification is complete. The time required for complete detoxification varies from 1 to 4 weeks—occasionally more than 4 weeks is required.

The conditions governing the rate of detoxification are not fully known. There are at least two factors of importance: the concentration of the formalin and the pH of the toxin mixture. Glenny[2] has shown that the greater the concentration of formalin, the more rapid is the rate of detoxification. Mr. Weld and I have confirmed this.[1] However, with large concentrations of formalin the antigenic value of the resulting product is lessened. The ideal then would be to add the minimum amount of formalin which will produce complete detoxification in a reasonable time. Unfortunately, at present there is no convenient method of determining the minimum requirement of formalin for a given toxin, but with the great

* Read before the Laboratory Section of the American Public Health Association, at the Fifty-fifth Annual Meeting at Buffalo, October 13, 1926.

† Prior to Ramon's publications, other workers had used formalin to detoxify bacterial toxins. A good summary of this early work is given by Nélis in the *Annales de l'Institute Pasteur*, Vol. 40, 1926. Ramon, however, was the first to advocate in a practical way the use of diphtheria toxoid for the immunization of humans.

‡ The concentration of formaldehyde in commercial formalin may be less than 40 per cent. It is advisable to check the strength of each lot of formalin by chemical analysis.

** Two effects may result from the presence of phenol or cresol in a toxin undergoing modification. The antigenic value may be greatly weakened or entirely lost; and the toxin mixture may become turbid.

majority of toxins which we have used a concentration of 0.3 per cent formalin has been entirely satisfactory.

There is a difference of opinion regarding the effect of the reaction of the toxin mixture on the rate of detoxification. Barikin[3] has stated that the more alkaline a toxin is, the slower is its rate of detoxification. The toxins with which we have worked have given the opposite result. For example, at pH 8.5, with a given toxin, the rate of detoxification has always been more rapid than at pH 7.0, *i.e.*, the more alkaline the toxin, the more rapid is its rate of detoxification.[1] While it is quite conceivable that unknown factors may operate so that this rule is not generally applicable, still it has worked so consistently with us that we apply it in making toxoid. If a toxin, after the addition of formalin, develops a reaction of pH 7.3 or less, we adjust the reaction to pH 8.0–8.3.

The toxin undergoing modification is tested for toxicity at weekly intervals. These preliminary tests are carried out by injecting intradermally 0.1 c.c. of the undiluted toxin and 0.1 c.c. of a $^1/_5$ and $^1/_{25}$ dilution into the skin of a guinea pig (after removal of the hair). Detoxification is considered complete when the $^1/_5$ and $^1/_{25}$ dilutions show a reaction of 5 mm. or less and the undiluted material a reaction of 12 mm. or less. When these intradermal tests indicate that the toxin has become non-toxic, the pooled material constituting each lot, is filtered through a Berkefeld candle into sterile containers. The toxoid is now ready for toxicity and potency tests.

In order to test toxicity, 5 c.c. amounts of the toxoid are injected subcutaneously into each of 5 guinea pigs (300 to 320 grams). At least 4 of the animals must remain normal for a month with no loss in weight.

The potency of the product is determined by injecting subcutaneously 0.5 c.c. amounts into each of 5 guinea pigs (300 to 320 grams). At the end of a month the animals are Schick tested and in the subsequent week they are again Schick tested. Immediately following the reading of the second Schick test 5 M.L.D.'s of diphtheria toxin are injected into each animal. At least 4 of the animals must survive. The results of the Schick tests give preliminary and confirmatory evidence regarding the immunizing value of the toxoid.

Following the potency and toxicity tests the toxoid is filled aseptically into glass ampoules and samples of these are tested for sterility. Finally, a sample of each filled lot is again tested for toxicity. One-tenth c.c. of the undiluted toxoid and 0.1 c.c. of a $^1/_{10}$ dilution are injected intradermally into a guinea pig. The $^1/_{10}$ dilution must show a reaction of 5 mm. or less and the undiluted material 12 mm. or less.

The best dosage of toxoid for humans has not been finally determined. The dosage which we at present recommend—two injections of 0.5 c.c. with a month interval between doses—has given excellent results in the limited number of persons (young adults) to whom we have personally given toxoid. However we realize that the problem is not solved. Toxoid immunizes certain individuals more readily than others. We have considerable evidence that those individuals who manifest a reaction* following an injection of toxoid, rapidly develop immunity. For example, the antitoxic content of the blood of one adult who had received a single injection of 0.1 c.c. toxoid rose rapidly from less than $^1/_{100}$ to more than $^1/_{10}$ unit per c.c. Since our preliminary work with toxoid immunization has been mostly in the young adult

* Experience so far has shown that the reactions following the administration of toxoid are very rare in children under 8 years. In older children and adults marked local, and even general reactions may occur. Children over 8 years of age frequently (25 per cent) show a local reaction, usually only a small area of redness, giving rise to no inconvenience. In a small percentage of these older children, and in a larger percentage of adults, marked local, and even general reactions occur. Such reactions may consist of induration, with an area of redness extending for several inches around the site of injection, together with malaise, headache and fever. These symptoms disappear in a few days. One may readily determine which individuals will react to toxoid. This is done by injecting intradermally 0.1 c.c. of diluted toxoid (1/20 dilution) into the skin. If no local area of redness is evident (less than 12 mm. in diameter) within 3 days, it indicates that no appreciable reaction will follow the administration of toxoid.

group, we do not know as yet whether the dosage we recommend is the optimum for every age group.*

From the laboratory point of view our purpose has been to distribute a safe product and one which possesses a certain standard of antigenic value for immunization against diphtheria.

* The toxoid which we distribute has been administered to about 50,000 children in various parts of Canada. The results of this work are not yet available.

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MOSQUITO WORK THROUGHOUT THE WORLD*

L. O. HOWARD, M.D., PH.D.

Chief, Bureau of Entomology, U. S. Department of Agriculture, Washington, D. C.

AS A PIONEER in mosquito control work, the writer is probably much more strongly impressed by the progress the world has made in this direction in the last thirty or thirty-five years than is the average individual or than are the experts who have come to the front much more recently. Thirty-five years ago, so far as I know, there had never been made in any part of the world a concerted intelligent effort to reduce the mosquito population. Our knowledge of mosquitoes was pitifully slight. We knew the detailed life history of one species only, and that was based upon the observations of Réaumur at Paris 150 years before. We assumed in general that all mosquitoes had the same life history. We spoke of "the mosquito." We did not realize that there are very many species and that the way the different species live varies greatly, and that methods of control must, therefore, vary greatly also. We did not know that any of the species carried disease, and we did not realize their vast economic importance.

To-day mosquito control work is going on all over the world. Yellow fever has almost ceased to exist. The Panama Canal has been dug and is in successful operation. Havana has become almost a health resort. The southern United States, relieved from the danger of epidemics of this dreadful disease, are striding ahead economically at a rate which we in the North hardly realize as yet. Enormous economic loss from malaria is being lessened rapidly all over our own country and in many portions of the world which have hitherto been resistant to advanced civilization, and in other regions where progress was arrested hundreds of years ago and advanced cultures practically destroyed, large-scale control of malarial mosquitoes has been begun and is being pushed. Not a week passes without the appearance of some important report on antimalarial work conducted to a more or less successful conclusion in some corner of the world. The most recent is an admirable, profusely illustrated report, *The Mosquito Breeding Grounds Within the Nairobi Municipal Area with Especial Reference to Waters Containing Anopheline Larvae*. In fact, a glance through an issue of the *Review of Applied Entomology* or the *Tropical Diseases Bulletin* shows that a volume of work of this kind is going on that must be really appalling to the bibliographer.

Of course, the great mass of this work is being done against the yellow fever and the malarial mosquitoes. The intimate

* Read before the Public Health Engineering Section at the Fifty-fifth Annual Meeting of the American Public Health Association, at Buffalo, N. Y., October 14, 1926.

biology, ecology and behavior of the former (a single species) is well known; but there are several species of mosquitoes that carry malaria, and, although intensive research work has been done with them since Ross's discovery, new points, especially about the less frequent species, are being recorded from time to time.

SPECIES GEOGRAPHICALLY DISTRIBUTED

The species of mosquitoes that are not yet convicted of the crime of carrying disease are vastly greater in number. They abound in all tropical and subtropical regions, in most temperate regions, and certain forms are found at considerable altitudes and in the far North. With the species that inhabit the Temperate Zone, we find great variations in methods of life—from the rain-water-barrel form, that breeds continuously throughout the summer and thus has many generations, to the woods mosquitoes of the more northern states and Canada that have but one generation a year and breed only in pools of melting-snow water in the spring; from the forms that breed only in the water accumulations in tree holes and pitcher plants to those that breed only in the salt marsh pools left by high tides along our coast.

Against many of these forms which—although they have not been convicted of the carriage of specific diseases, still when occurring in great abundance have undoubtedly great significance from the health point of view and surely have a very great effect upon property values and general economic prosperity—large-scale work is still more recent. There was, for example, no well founded hope of control of the salt marsh mosquitoes until the remarkable biology of two of these species was worked out by the late Dr. John B. Smith of New Jersey years after the malarial discoveries of Ross and the conclusive yellow fever experiments of Reed, Carroll and Lazear; and yet the State of New Jersey is to-day and for several years has been controlling the salt marsh mosquito pest of her seacoast, largely through engineering methods, to such an extent that land has been reclaimed for agriculture and industrial purposes. Her resorts are flourishing as never before. Her people are happier and healthier, and the state is far richer in the taxable value of her coastal land. There should be no hesitation in classifying the magnificent New Jersey work under the head of sanitary engineering.

If, by a slight violation of our desire for purism in definition not uncommon among people who like to use for themselves the distinguished title of "engineer" (with one or another modification), this great work be accepted as sanitary engineering, a very great field is opened to the sanitary engineer. Why should we not in fact avoid criticism by creating the title "mosquito engineer"? The late H. C. Weeks of Long Island did use this title once in speaking of himself.

PUBLIC HEALTH ENDANGERED IN LOUISIANA

In 1925 there was a great flight of salt marsh mosquitoes, presumably from the enormous area of salt marsh in St. Bernard Parish of Louisiana, which extended along the coast of the Gulf of Mexico from Port Arthur, Texas, to Biloxi, Mississippi, and beyond. The result of this flight (which, by the way, followed a long drought) was that the people along that great stretch of charming coast were driven almost to despair. Out-of-door life is reported to have been almost impossible; public health was surely involved; an entirely justifiable and marked real estate advance was at least temporarily interrupted; local health officers were overwhelmed with requests for aid; and all of the admirable work against the local breeding of malarial and other mosquitoes that had been done here and there at great expense was discredited in the public eye. It would have been only natural for the people of Gulfport, for example, to have said, "Why should we go to the expense of our health officer's operations against mosquitoes, when such

an invasion as this comes to us?" Thus, in a new although indirect way the salt marsh mosquito becomes a problem for the sanitary engineer.

Now mark the result of this flight: Last winter the Congress of the United States appropriated a sum of money for a survey of salt-marsh mosquito-breeding territory and placed the appropriation in charge of the U. S. Public Health Service. Clearly then, in the eyes of Congress, it is a public health problem.

The survey to be made will be a laborious one and will involve the services of expert biologists and of drainage engineers. The character of the tides and the lie of the land are different from those of the north Atlantic coast, and the area to be surveyed is very much greater. It is a surprise to most of us to know that more than one-half of the salt marsh area in the whole of the United States lies within the State of Louisiana. What a problem it is—first to find out what must be done, then to find out some way of doing it, and finally, *to pay for it!* There is this comforting thought, that in destroying the breeding places in this seven thousand square miles much very valuable land will be reclaimed and one of the most attractive coasts in the country will be in the way of fulfilling its destiny as a wonderful summer and winter resort.

PROTECTING SUMMER RESORTS

But there are other summer resorts than the sea coast. The north woods of Maine, the White Mountains, the Adirondacks, the Catskills, northern Michigan, Wisconsin and Minnesota and states farther west have hundreds, perhaps thousands, of summer resorts harboring mosquitoes of quite different breeding habits that from time to time become distressingly abundant. Those that inhabit the Northeast are usually gone by the time of the advent of the greater part of the summer visitors. Those visitors who arrive in June are for the most part content to suffer a few mosquito bites with the fair certainty that the biters will disappear very shortly. But the present spring was very late and the mosquitoes came out much later than usual, with the result that they stayed and bit much later than usual.

These mosquitoes lay their eggs in dry depressions in the ground which will be filled by melting-snow water in the spring. The eggs hatch in this water in the spring time, the larvae develop rapidly, and the adult mosquitoes emerge in late April or May, persist into June or July, lay their eggs, and die. The problem is to locate these early spring breeding places and to abolish them. It can be done, although in many cases it will involve great expense. It should be understood distinctly that these northern species do not breed in permanent standing water nor in chance accumulations of water during the summer.

Much money is still being wasted in northern and mountainous regions in the treatment of swamp land and permanent water accumulations in which mosquitoes *do not breed*. This has been done even in recent years in western national parks and forest reservations.

Although the necessity for engineering work was pointed out very early in the first serious movements toward mosquito control and although the mosquito problem was attacked from the engineering point of view on a comparatively large scale in the early years of the present century by New Jersey under the leadership of Dr. John B. Smith, on Staten Island under Dr. A. H. Doty, and at Sheepshead Bay and other points on Long Island under the stimulus of the energetic late H. C. Weeks, and at other restricted and isolated points, it needed the antimalarial necessities created by the World War to bring the attention of skilled sanitary engineers to the larger problems. However, it must not be forgotten that the Panama Canal work, so wonderfully described in LePrince and Orenstein's book, provided an even earlier and very great stimulus.

IMPETUS GIVEN BY WORLD WAR

Following the war a number of articles and several books were published describing the details of procedures in malaria control at various points near the front and in concentration camps, and naturally many or most of them were large-scale measures involving engineering competence.

A good example of these papers is a small book by Willoughby and Cassidy of the British service, entitled *Antimalaria Work in Macedonia Among British Troops.** It is interesting to note that in this book the importance is stressed of the choice of camp sites for the many troops not actually in the front line. This is an interesting contrast to the deliberate choice by the medical authorities of our own army of many concentration camps in this country in notorious mosquito and malarious regions. This was due probably to Surgeon General Gorgas's confidence in his ability to control mosquito breeding, based upon his successful work in Havana and the Panama Canal Zone.

The ditching and drainage of swamps, the siphoning of rock pools, the channeling of waste water, the filling in or accidental depressions, the care of engineering channels—all are engineering points which are brought out in these and other similar quasi-contemporary publications.

Four years later a sanitary engineer, W. E. Hardenburg, wrote a very good book, *Mosquito Eradication,*† in which the chapters on "Inland Drainage" and "Salt Water Drainage" are very comprehensive and informative. The chapter on "Initiating the Campaign" contains much good practical advice. There is another very practical chapter, "Administration Aspects of the Campaign." A chapter, "The Development of Control Measures," describes the important antimalaria work of the U. S. Public Health Service in the southern United States beginning in the spring of 1914 and continuing through the war and later.

The latest book on the subject, dealing especially with engineering problems, is *The Engineer and the Prevention of Malaria,* by Henry Home, member of the Institute of Civil Engineers.‡ The author has worked on this problem on the Central American coast, the West Indies, the west coast of Africa, Egypt, and Syria. The bulk of the book treats of lowland drainage, hill drainage, details of works, and antimalarial services, giving sound, practical points.

There is not, however, a sounder paper, from the standpoint of the sanitary engineer, than was presented before this Association at its 1924 meeting at Detroit by J. A. LePrince.[1]

In a series of eleven paragraphs, LePrince points out what the engineer can do. These points should be displayed on the desk of every sanitary engineer.

SUMMARY

In conclusion, the following points should be emphasized: The control of all species of mosquitoes is sanitary work and should be promoted in every way by sanitary authorities.

In all control work in which more than one species of mosquito is involved, engineers and the health people should coöperate closely with the entomologists, since there is so great a variation in the life habits and breeding places of the different species.

In most localities mosquito annoyance and mosquito-borne disease are unnecessary and can be controlled. Their continued existence is a blot on the fair page of modern civilization.

ADDENDUM

In what is written above we have not brought out the fact that, although fair mosquito control measures have been developed, there is still much work to be done looking towards easier and more

* H. K. Lewis & Co., Ltd., London, 1919.
† McGraw-Hill Book Co., New York, 1922.
‡ London, Chapman & Hall, Ltd., 1926.

efficient measures. Much will doubtless depend upon full studies of the general ecology of the individual species. There is also much promise in the work upon the intimate constitution of mosquito-breeding waters, such as is being done by Rudolfs, Senior-White, MacGregor and others. The field of electricity in all its possibilities has not been explored at all thoroughly. In fact, much experimental work of potential practical value remains to be done by the biologists and by the engineers.*

* Rapid summaries of the work done in different parts of the world since 1912 have been prepared by the writer and published in the Reports of the New Jersey Mosquito Extermination Association for the years 1920, 1923, 1924 and 1925.

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A STATISTICAL SURVEY OF THE SANITARY CONDITION IN CUBA*

JOSÉ E. LOPEZ-SILVERO, M.D.
National Department of Health, Havana, Cuba

IT IS A GREAT pleasure for me as a delegate of my government to this meeting of the American Public Health Association which is so well known to the Cuban medical profession, to participate at a conference where so many important facts and problems of public health and sanitation are to be discussed.

America has its own problems to solve and it is evident that Cuba by virtue of its geographical situation, so near the United States, must progress and advance in public health.

If we review the history of the development of public health in Cuba, we are amazed at the remarkable progress which has been made in the short years of our Republican era, notwithstanding the hazards and difficulties that have beset the public health officials in many urban and rural communities.

A glorious and fundamental public health achievement in which the United States and Cuba played a prominent part was the complete eradication of yellow fever in Cuba and in the Caribbean countries. When we recall the yellow fever campaign we must also remember the conspicuous work done by Dr. Carlos Finlay on the theory of the relation of the mosquito to this dread disease which he announced at the Sanitary Conference in Washington, D. C., in 1881, and the later achievement of the illustrious General William Gorgas who applied the theories of Finlay in 1901, which resulted in that great sanitary victory, the extermination of yellow fever in Cuba.

HOW PUBLIC HEALTH FUNCTIONS

To develop good citizens with excellent physical and mental powers is a task of years. To fight vice in all its aspects is a noble work which will eventually produce a powerful and efficient government.

These and other matters of equal importance are the tasks undertaken by the Cuban Sanitary Department (Secretaria de Sanidad). The necessary steps to enforce sanitary laws and to contribute to the welfare of the country have already been taken.

The establishment of a medical school for the training of physicians in public health and sanitation is progressing. Other measures against preventable dis-

* Read before the Vital Statistics Section of the American Public Health Association at the Fifty-fifth Annual Meeting at Buffalo, N. Y., October 11, 1926.

eases are being carried on. The regulation of drugs, narcotics and narcomaniacs is being given special attention. Improvement of the methods and regulations dealing with the drug traffic has resulted from solving the many new prbolems which daily confront the government officials.

FUTURE PROGRAM

Our work will be divided into two parts: The first corresponds to the death rate, demographic statistics of the Municipal District of Havana during the year 1925, including the death rate from cancer and tuberculosis since 1890 and the infantile mortality in Havana for 25 years. The second part is a general survey of the infectious diseases in the six provinces that constitute the Republic. This survey will be based on reports of health officers from July, 1925, to June, 1926.

DEATH RATE. YEAR 1925
MUNICIPAL DISTRICT OF HAVANA

Diseases	Total deaths 1925	Total deaths 1924	Coefficient per 100,000 inhabitants 1925	Coefficient per 100,000 inhabitants 1924
Increased				
Malaria	19	16	4.76	4.07
Measles	31	2	7.77	0.51
Diphtheria	19	12	4.76	3.05
Dysentery (amebic)	4	3	1.00	0.76
Tuberculosis, pulmonary	1062	978	266.12	248.90
Tuberculosis (all)	1112	1034	278.65	263.15
Cancer (in all its forms and localizations)	542	458	135.82	116.56
Rheumatism (chronic and acute)	22	19	5.51	4.84
Anemia, chlorosis	72	58	18.08	14.76
Heart diseases (organic)	667	650	167.14	165.42
Arterial diseases	708	680	177.41	198.51
Chronic bronchitis	112	96	28.07	24.43
Bronchial pneumonia	314	306	78.68	77.88
Pneumonia	54	48	13.53	12.22
Enteritis (less than 2 years)	818	772	204.98	196.47
Enteritis (more than 2 years)	285	268	71.42	68.21
Diseases of the liver	55	35	13.78	8.91
Chronic nephritis	272	260	68.16	66.17
Puerperal eclampsia	21	14	5.26	3.56
Vicious conformations	43	42	10.78	10.69
Senility	48	47	12.03	11.96
Alcoholism	7	4	1.75	1.02
Suicide (in all its forms)	146	99	36.59	25.20
Diminished				
Typhoid fever	84	207	21.05	52.68
Whooping cough	4	12	1.00	3.05
Grippe (influenza)	56	58	14.03	14.76
Leprosy	1	2	0.25	0.51
Meningitis (simple)	37	76	9.27	19.34
Syphilis	29	36	7.27	9.16
Infantile convulsions	26	38	6.52	9.67
Cirrhosis hepatica	80	96	20.05	24.43
Nephritis (acute)	51	56	12.78	14.25
Congenital feebleness	151	172	37.84	43.77
Angina pectoris	39	48	9.77	12.22

INFANTILE MORTALITY

In Havana 1,880 children under fourteen years of age died during 1925.

	Year	Percentage
Average death	1924	24.51
Average death	1925	23.87

COMPARATIVE STUDY OF INFANT MORTALITY IN HAVANA

Year	Coefficient	Average
1901	253.99	
1902	200.67	
1903	134.33	182.85
1904	170.77	
1905	154.53	
1906	218.84	
1907	189.85	
1908	155.13	175.31
1909	160.73	
1910	152.01	
1911	230.34	
1912	124.63	
1913	214.19	178.03
1914	113.59	
1915	207.43	
1916	214.51	
1917	115.59	
1918	119.52	145.86
1919	117.08	
1920	162.64	
1921	148.45	
1922	70.19	
1923	156.51	138.98
1924	159.14	
1925	142.46	
Total average in twenty-five years		157.15

TUBERCULOSIS AND CANCER MORTALITY
DISTRICT OF HAVANA

Year	Mortality 100,000 Inhabitants Tuberculosis	Cancer
1890	772.07	
1891	737.98	
1892	708.80	
1893	611.78	
1894	588.86	
1895	715.21	
1896	683.98	
1897	821.36	
1898	1173.00	
1899	529.22	58.66
1900	345.51	56.84
1901	356.67	67.77
1902	351.35	65.16
1903	371.73	77.10
1904	411.03	74.35
1905	408.48	80.38
1906	392.81	90.91
1907	390.74	89.38
1908	385.81	103.53
1909	316.64	109.69
1910	327.42	105.80
1911	342.42	104.42
1912	312.24	99.16
1913	306.73	108.80
1914	323.37	117.34
1915	315.72	110.77
1916	328.68	112.86
1917	335.49	124.31
1918	387.56	112.62
1919	333.78	127.00
1920	332.82	114.29
1921	291.85	108.94
1922	286.32	110.34
1923	239.67	125.14
1924	263.15	116.56
1925	278.65	135.12

The Republic is free of diseases subject to quarantine measures such as yellow

MONTHLY CHART OF PREVAILING DISEASES BY PROVINCES, FROM JULY TO DECEMBER, 1925

1925 Months	Provinces	Typhoid Fever	Paratyphoid Fever	Malaria	Diphtheria	Scarlet Fever	Measles	Chickenpox	Infantile Tetanus	Yellow Fever	Infectious Jaundice	Smallpox	Plague	Cerebrospinal Meningitis	Infantile Paralysis	Asiatic Cholera	Glanders	Exanthematic Typhus
July	Pinar del Rio	25	7	2	5	1	9	..	1	..	..	..	..	..	..	..	..	..
	Habana	96	13	70	12	33	175	1	..	..	..	..	..	1	..	..	..	..
	Matanzas	37	2	2	4	..	16	..	1	..	..	..	..	..	..	..	..	..
	Santa Clara	141	15	10	3	..	26	2	1	..	..	..	..	..	..	..	..	..
	Camagüey	18	1	67	..	..	47	..	..	..	..	..	..	..	..	..	..	..
	Oriente	36	1	985	3	..	55	3	..	..	..	..	..	..	..	..	..	..
	Total	353	39	1836	27	34	328	6	3	..	..	..	..	1	..	..	..	..
August	Pinar del Rio	10	..	..	6	..	25	..	..	..	..	..	..	..	..	..	..	..
	Habana	63	2	132	12	11	167	5	2	..	..	..	..	..	..	..	..	..
	Matanzas	48	6	3	6	..	2	..	2	..	..	..	..	..	..	..	..	..
	Santa Clara	72	13	3	5	..	33	..	..	..	..	..	..	..	..	..	..	..
	Camagüey	14	..	38	2	..	28	..	..	..	..	..	..	..	..	..	..	..
	Oriente	25	20	485	4	..	128	8	..	..	..	..	..	..	..	..	..	..
	Total	231	41	661	35	11	383	13	4	..	..	..	..	..	..	..	..	..
September	Pinar del Rio	5	5	5	2	..	9	..	..	..	..	..	..	..	..	..	..	..
	Habana	54	9	93	16	19	88	1	1	..	..	..	..	..	..	..	..	..
	Matanzas	21	1	8	3	..	11	1	1	..	..	..	..	..	..	..	..	..
	Santa Clara	62	6	13	4	..	26	..	..	..	..	..	..	..	..	..	..	..
	Camagüey	2	..	56	1	..	5	..	..	..	..	..	..	..	..	..	..	..
	Oriente	16	1	256	10	..	186	6	..	..	..	..	..	..	..	..	..	..
	Total	160	22	411	36	19	325	8	2	..	..	..	..	..	..	..	..	..
October	Pinar del Rio	7	5	5	2	..	5	1	..	..	..	..	..	..	..	..	..	..
	Habana	37	5	87	13	16	84	12	1	..	..	..	..	..	..	..	..	..
	Matanzas	7	2	1	1	7	2	..	1	..	..	..	..	..	..	..	..	..
	Santa Clara	23	8	8	4	..	19	..	..	..	..	..	..	..	..	..	..	..
	Camagüey	..	..	57	2	..	2	1	1	..	..	..	..	..	..	..	..	..
	Oriente	15	1	344	4	..	107	2	..	..	..	..	..	..	..	..	..	..
	Total	89	21	502	26	23	219	16	3	..	..	..	..	..	..	..	..	..
November	Pinar del Rio	16	6	3	1	..	4	..	2	..	..	..	..	..	..	..	..	..
	Habana	28	3	65	23	21	131	6	..	..	..	..	..	..	..	..	..	..
	Matanzas	6	3	3	1	..	37	..	..	..	..	..	..	..	..	..	..	..
	Santa Clara	19	3	6	8	..	13	1	..	..	..	..	..	..	..	..	..	..
	Camagüey	6	1	86	1	..	28	..	..	..	..	..	..	..	..	..	..	..
	Oriente	13	..	337	4	..	121	..	..	..	..	..	..	..	..	..	..	..
	Total	88	16	500	38	21	331	7	2	..	..	..	..	..	..	..	..	..
December	Pinar del Rio	8	3	3	..	1	1	..	..	..	..	..	..	..	..	..	..	..
	Habana	15	6	66	12	11	64	20	..	..	..	..	..	1	..	..	..	..
	Matanzas	..	2	2	3	..	91	4	2	..	..	..	..	..	..	..	..	..
	Santa Clara	10	1	5	6	..	17	1	1	..	..	..	..	..	..	..	..	..
	Camagüey	2	..	104	..	..	3	2	..	..	..	..	..	..	..	..	..	..
	Oriente	9	1	342	9	..	43	31	..	..	..	..	..	..	..	..	..	..
	Total	44	13	522	30	12	219	58	3	..	..	..	..	1	..	..	..	..

fever, smallpox, plague, Asiatic cholera, typhus exanthematic, recurrent fever, melitocosis and others.

Due to the prevalence of smallpox in the south of the United States, strict measures have been adopted by the Department of Health and compulsory vaccination against this disease has been enforced in the six provinces. Other restrictive measures have been adopted against the importation of alastrim from Jamaica and other islands of the Caribbean. Besides the cases of contagious diseases reported by the physicians, complementary statistics are compiled in the District of Havana.

Disease	Cases reported 1924	1925	
Tuberculosis	1236	1341	
Measles	173	1147	(epidemic)
Malaria	678	739	(increased by non-desirable immigration)
Diphtheria	157	167	
Scarlet fever	147	38	
Cerebrospinal meningitis	7	8	
Typhoid fever	1082	390	
Paratyphoid fever	*	21	
Chickenpox	80	334	
Infantile tetanus	1	*	
Leprosy	4	8	

* Cases not reported.

MONTHLY CHART OF PREVAILING DISEASES BY PROVINCES FROM JANUARY TO JUNE. 1926

1926 Months	Provinces	Typhoid Fever	Paratyphoid Fever	Malaria	Diphtheria	Scarlet Fever	Measles	Chickenpox	Infantile Tetanus	Yellow Fever	Infectious Jaundice	Smallpox	Plague	Cerebrospinal Meningitis	Infantile Paralysis	Asiatic Cholera	Glanders	Exanthematic Typhus
January	Pinar del Rio	10	..	1	1	2	2	8	1	..	..	..	..	..	..	..	..	..
	Habana	30	3	72	14	16	103	50	..	..	..	..	..	..	..	..	..	..
	Metanzas	16	19	4	3	..	149	7	1	..	..	..	..	..	..	..	..	..
	Santa Clara	22	6	4	7	7	14	11	..	..	..	..	..	..	..	..	..	..
	Camagüey	2	..	43	1	..	4	1	..	..	..	..	..	2	..	..	..	..
	Oriente	15	..	680	1	..	72	7	1	..	..	..	..	2	..	..	..	..
	Total	95	28	804	27	25	304	84	3	..	..	..	..	4	..	..	..	..
February	Pinar del Rio	15	3	..	1	2	11	9	1	..	..	..	..	..	..	..	..	..
	Habana	48	5	43	22	33	177	69	..	..	..	..	..	..	..	..	..	..
	Matanzas	204	13	3	1	..	185	14	1	..	..	..	..	..	..	..	..	..
	Santa Clara	28	5	3	4	..	37	13	1	..	..	..	..	..	..	..	..	..
	Camagüey	6	..	33	..	..	5	7	..	..	..	..	..	..	..	..	..	..
	Oriente	33	..	582	8	..	80	18	..	..	..	..	..	..	..	..	..	..
	Total	334	26	664	36	35	495	130	3	..	..	..	..	..	..	..	..	..
March	Pinar del Rio	13	5	3	3	1	13	5	..	..	..	..	..	..	..	..	..	..
	Habana	38	6	44	22	43	258	108	..	..	..	..	..	1	..	..	..	..
	Matanzas	9	8	4	3	..	86	34	3	..	..	..	..	..	..	..	..	..
	Santa Clara	22	6	2	2	..	100	18	..	..	..	..	..	..	..	..	..	..
	Camagüey	6	..	10	2	..	3	8	..	..	..	..	..	..	1	..	..	..
	Oriente	34	2	672	14	..	121	11	..	..	..	..	..	..	..	..	..	..
	Total	122	27	735	46	44	581	184	3	..	..	..	..	1	1	..	..	..
April	Pinar del Rio	11	4	4	1	..	17	4	..	..	..	..	..	..	..	..	..	..
	Habana	46	4	44	20	27	263	173	..	..	..	..	..	1	..	..	..	..
	Matanzas	16	1	..	3	..	52	16	..	..	..	..	..	..	..	..	..	..
	Santa Clara	19	8	3	2	..	149	32	1	..	..	..	..	..	..	..	..	..
	Camagüey	9	..	3	1	..	..	8	..	..	..	..	..	..	..	..	..	..
	Oriente	28	..	502	4	..	47	23	2	..	..	..	..	..	..	..	..	..
	Total	129	17	556	31	27	528	256	3	..	..	..	..	1	..	..	..	..
May	Pinar del Rio	17	4	5	1	..	10	..	..	..	..	..	..	..	..	..	..	..
	Habana	48	8	49	19	16	110	25	..	..	..	..	..	..	..	..	..	..
	Matanzas	6	6	1	3	..	26	12	1	..	..	..	..	..	..	..	..	..
	Santa Clara	39	13	1	2	..	87	1	..	..	..	..	..	..	..	..	..	..
	Camagüey	..	..	7	..	..	..	1	..	..	..	..	..	..	..	..	..	..
	Oriente	52	4	261	5	..	99	..	..	..	..	..	..	..	..	..	..	..
	Total	162	35	324	30	16	332	39	1	..	..	..	..	..	..	..	..	..
June	Pinar del Rio	18	3	6	..	..	3	3	..	..	..	..	..	..	..	..	..	..
	Habana	138	7	71	17	31	70	9	..	..	..	..	..	..	..	..	..	..
	Matanzas	19	9	1	..	..	31	1	..	..	..	..	..	..	..	..	..	..
	Santa Clara	76	22	1	1	..	77	1	..	..	..	..	..	..	..	..	..	..
	Camagüey	9	..	5	1	..	..	..	..	..	..	..	..	..	..	..	..	..
	Oriente	33	2	296	5	1	..	..	..	..	..	..	..	..	..	..	..	..
	Total	294	43	380	24	32	181	14	..	..	..	..	..	..	..	..	..	..

I am indebted to Dr. Le Roy and Dr. Montoro of Havana for the complementary statistical information.

This is a brief résumé of the present sanitary condition of the youngest of the Latin American Republics. Most effective results are expected in the near future from the general measures adopted by those who govern the Department of Public Health.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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THE PUBLIC AND PUBLIC HEALTH

VERY SIGNIFICANT news comes to us from England in the announcement that public lectures on Health and Disease will be given under the auspices of the British Medical Association. This staid and dignified body has in the past frowned on popular lectures of this kind on the ground that they were unethical. In a recent address, Sir Thomas Horder declared that the public desired such lectures and meant to have them. The action of the association came is response to this general demand.

Only about a year ago an association was formed in England with the ostensible purpose of giving instruction to the public on health. Rather unfortunately, as it seemed to some, the efforts ran in one direction—largely toward exploiting certain fads, and as far as our information goes, the movement was not a great success. The English people can, therefore, be congratulated on the action of the British Medical Association, since they are sure to have real scientific facts presented to them in an authoritative manner.

In the United States a somewhat similar effort was made upwards of fifteen years ago, but did not meet with success. Since that time the American Medical Association has founded *Hygeia,* which we believe fills a very useful place. Other societies are putting out a great deal of useful and correct material, and so is our Public Health Service, to say nothing of what comes from our many states and city boards of health. Many of our newspapers run health columns, some of which are in general excellent, though almost all of them furnish material for "Tonics and Sedatives" occasionally. Material on health and disease is greedily taken by the press in general. It is unfortunate, however, that our press caters to the sensational, and the really great successes along the line of instructing(?) the public have been achieved by so-called health journals which teach anything rather than what is correct, and which usually cultivate some fad to the exclusion of common sense and sound doctrine, or are house organs for the advertisement of some alleged expert or physical culturist.

We believe that the call upon public health workers in all lines, whatever degrees they may hold, or in whatever activity they may be engaged, is a loud one. We are constantly criticized by laymen for not being able to put our stuff over, in which there may be, and often is, a large amount of truth. The scientific mind does not readily lend itself to language which appeals to the public, and as far as medicine goes, we must abandon the long cherished fetish of secrecy.

We live in wonderful and peculiar times. The public is ready to believe anything. The scientific man is ready to believe anything which comes from a proper source, and we should not be too severe with the layman who has not been trained to examine sources. What, for instance, could be more incredible, seemingly, than the radio, radioactivity and some of the recent developments in electricity? Can we blame laymen, and especially the untrained ones, for accepting such wonders as the vibrator of Abrams? To the public, a doctor is a doctor, whether he has earned the title legitimately or is using it fraudulently, or has slipped through in some state which has easy-going laws. Indeed, in our most renowned seats of higher learning we find quackery almost as rampant among the learned professors as we do among the ignorant laymen.

The answer to the question is education. This duty is incumbent upon the medical profession in general, but especially incumbent upon those who profess and call themselves public health workers.

CHANGES IN THE FOOD SUPPLY

THE DIETARY HABITS of our population are always of interest to those concerned with the public health, so any changes in our food supply are subject to the closest scrutiny.

According to the Food Research Institute of Stanford University a statistical study of flour consumption in the United States shows that during the last 20 years the dietary has been altered in some important respects. It should be pointed out, as is done by the author of the study[1] in question, that the data as to flour production and consumption are not satisfactory. If it is assumed, however, that the deductions as to per capita consumption are reasonably correct, and they probably are, it is evident that individuals of the United States are consuming much less flour than did their parents 20 or more years ago. According to the report cited, consumption per capita decreased 10 per cent in the period 1904–19, and again decreased 12 per cent in the period 1919–23.

As is to be expected, the chief causes of the decrease are economic, though others are undoubtedly operative also. Probably the most important of these causes is the increased buying power of the laboring classes, which has permitted them to diversify their diet, and purchase more expensive articles of food. Some of the more important results of this change are the substitution of sugar for flour, and the increased use of dairy and poultry products, fruit, and vegetables. An additional reason for the decreased use of flour, however, is the decreased consumption of food as a whole. The increased use of machinery has lessened the amount of manual labor performed, and so the per capita requirement for energy is also less.

As to the future of flour consumption, that would seem to depend on economic conditions, and this may improve, remain stationary, or suffer a relapse. It is probably true, however, that the use of labor saving machinery will continue to increase and so we may in the future expect a further decrease in per capita consumption of food. If this occurs, we may expect also a continued decrease in the use of flour.

Before commenting on the review just given it may be well to emphasize again the difficulty in securing complete data as to the quantities of various foods that are actually consumed. However, if a substitution of sugar for flour has occurred to

any considerable extent, we would like to be able to estimate the probable effect of the change on the general well being of the population. At present, such an estimate is not readily made as data on the total nutrients consumed are far from complete. However, there seems to be no cause for alarm. Probably it is true that a carbohydrate, almost chemically pure, is being substituted for a mixture which contains at least some quantity of protein, minerals, and usually vitamins, in addition to carbohydrate and fat. Such a substitution on a large scale would indeed be deplorable, but in this case dairy and poultry products, vegetables, and fruits, are also being increased in the diet, probably with a net gain so far as state of nutrition is concerned.

1. *The Decline in per capita Consumption of Flour in the United States. Wheat Studies of the Food Research Institute.* Stanford University, California, 2:8 (July), 1926.

THE CONTAGIOUSNESS OF SCARLET FEVER

MEDICAL JOURNALS in this country and in Europe have for some time past contained numerous articles on the control of outbreaks of scarlet fever by the Dick test and immunization either with the toxin or with the antitoxin. There can be little doubt that most of these articles are essentially correct, though some of them are perhaps over optimistic and have not taken into account the natural history of scarlet fever. Scarlet fever is not nearly so infectious as some other diseases—measles for example—and it is very much easier to get good results from preventive measures we may use than it is in the case of more readily communicable diseases.

Years ago it was pointed out that of children exposed to scarlet fever, all of them equally susceptible as far as was known, many would escape the disease. This well known fact which has apparently been overlooked by some, has recently had striking confirmation in the observations of Dr. Clendennin,[1] a medical officer of health in England. During the past year in his district, 107 cases of scarlet fever were reported from 96 houses, in 86 of which there was only a single case, in 9 houses 2 cases, and in only one 3 cases. In these 86 houses with single cases, 249 children under 15 years of age, with no history of having had scarlet fever, resided. For the years 1924–1925 he has made a study of the exposures according to the number of persons per room, and the incidence rate in houses of different sizes, from 1 to 8 rooms, and also the figures for houses from which cases were removed to hospitals, as compared with those in which the cases were treated at home. The results, extending however over only two years, indicate that crowding does not increase the attack rate. It is pointed out that hospital isolation has been avoided as much as possible, and only done after a careful inquiry as to the possibility of effective treatment at home.

Health officers of universities and communities know that scarlet fever does not spread in any alarming degree among adults. The figures given by Dr. Clendennin corroborate what was pointed out long ago, that many children susceptible, as far as we know, do not contract scarlet fever after exposure. In estimating the value of our prophylactic measures these facts must be taken into account.

This point is emphasized also by Dr. Garrett,[2] medical officer of health of Cheltenham, who states, as the result of an experience of 35 years, that in spite of quite free contact in the home, scarlet fever is often limited to a single individual.

He criticises the results reported by Dr. Harries, Dr. Hervey, and Dr. Fellows,[3] who based their favorable opinion on the supposed control by the Dick test of an outbreak of scarlet fever, and immunization by antitoxin of 14 children who were positive to this test, holding that a positive test did not prove that these children or even a large proportion of them would have contracted scarlet fever. He suggests that the evidence would have been much more conclusive had these 14 positive cases been divided into two equal groups, one immunized and the other left unimmunized.

Without any intention of discrediting in general the results obtained, we feel that this warning must be given. Only a large number of carefully controlled results will finally tell us the exact truth. The cynical advice of the old doctor carries also a warning which should be always borne in mind: "Be sure to use a new remedy promptly while it is still doing good."

1. *Med. Off.*, June 5, 1926, p. 238.
2. *Brit. M. J.*, June 12, 1926, p. 1011.
3. *Brit. M. J.*, May 22, 1926, p. 864.

EFFECTS OF NUTRITION ON GROWTH AND RESISTANCE TO INFECTION

FOR A NUMBER of years, and especially since the discovery of the rôle played by vitamines in nutrition, there has been a tendency to attribute every ill of mankind to a deficient or faulty diet. No one questions the importance of a proper diet, yet here and there we find researches which tend to throw doubt upon the extreme views which have been put forward by certain so-called nutrition experts.

A most careful and exhaustive study has recently been published by the Medical Research Council of England,[1] which throws considerable doubt on matters which have been accepted as almost axiomatic. From 1919 to 1923 an investigation of the poorer classes in the three largest cities in Scotland, and of laborers and miners of the rural districts of the same country, was carried out. It has been shown previously that city dwellers are on the average shorter and lighter than country people, and the cause of this difference has been widely attributed to a deficient supply of suitable food. The workers expected to find a close correlation between the nutrition of a child and the income of the family, expressed as per person, but have not been able to show this. The argument that an increase of wages would of itself lead to better growth is not supported by their findings. The effect of overcrowding with consequent decrease of air-space per person was also found to be insignificant, though the investigators point out that their failure to establish such a correlation does not exclude the possibility of such connection and may only mean that some other factors are dominant. One factor of this kind was found to be "maternal efficiency," and this again was found to depend, at least to some extent, upon air-space per person, but also upon the size of the family, *i.e.*, overcrowding. Overcrowded dwellings and an inferior type of mothers were found to go hand in hand, though which was cause and which was effect was not clear. Bad parents tend to select poor houses, irrespective of income.

An apparent lag was observed in the growth of the town children before the middle of the second year of life, but after the age of 18 months the rate of growth was satisfactory. The cause of the lag was not determined and remains an impor-

tant point for future investigation, though the growth after 18 months indicates that deficient diet was not the cause.

The authors of this report point out that their study is a piece of pioneer work, being "the first extensive attempt to estimate the influence of various environmental conditions on the growth and nutrition of the slum children." The general conclusion is that heredity and the inherited growth impulse play a large part in determining the growth of the child and that in spite of what may be considered injurious environments, the slum child tends to develop on the lines of its parent.

They recognize that many of their findings are inconclusive, but believe that it has been shown that the remedy heretofore suggested by sociological and political theorists, namely, an increase of income, would not of itself remedy the existing evils, while on the other side, the extreme eugenists are equally at fault.

Almost coincident with the appearance of this report, is another along somewhat the same lines, in which the relation of lowered resistance to malnutrition has been studied among the school children of Vancouver.[2] In this city, a height-weight-age survey of the public school children had been made in 1923 and a similar one in 1925, to which the most recent classification by Dr. Wood and Dr. Baldwin was applied. The general results of this study have been to show that malnutrition as observed in 8,000 children exerts no injurious influence upon the ill nourished. The proportion of infection among the well nourished and the ill nourished is exactly as 1 to 1. The authors, who investigated the incidence of six infectious diseases in the school children of Vancouver, point out that there is considerable variation in the individual diseases, which leads them to believe that there is no "general resistance to infection, lowerable by a general cause such as malnutrition." If there were such a thing as "general resistance" which could be lowered for one disease it would be reasonable to suppose that it was lowered for all. Their study showed that where the resistance was apparently lowered to scarlet fever, it was raised to chickenpox. On the other hand, it has been held that the incidence of scarlet fever corresponded with wealth and overnutrition, and even if such conclusions are not accepted, they at least do not indicate that malnutrition predisposes to infection in this disease. The authors conclude that their findings should not be used against the belief that good nutrition is beneficial. It is too well known that it makes for efficiency, general well being and physical capacity, but they hold that their study shows that malnutrition has one less untoward responsibility than is usually attributed to it.

The two pieces of work emphasize the danger of running to fads: they point out the danger of accepting dicta, and show the value of the open mind in making investigations.

1. *Child Life Investigations. Poverty, Nutrition and Growth. Studies of Child Life in Cities and Rural Districts of Scotland.* London: Published by His Majesty's Stationery Office, 1926.
2. *Pub. Health J.*, Toronto, Canada, September, 1926.

ASSOCIATION NEWS

PROCEEDINGS OF THE EXECUTIVE BOARD AND GOVERNING COUNCIL DURING THE FIFTY-FIFTH ANNUAL MEETING

THE Executive Board held two meetings, and the Governing Council four during the Fifty-fifth Annual Meeting at Buffalo, October 11-14. A digest of the proceedings of both bodies is published herewith for the information of members in accordance with the recommendation of the Council.

GOVERNING COUNCIL
OCTOBER 10 MEETING

Report of Chairman of Local Committee—F. E. Fronczak, M.D., Chairman of the Local Committee on Arrangements for the Buffalo meeting, reported on the plans that had been made for the entertainment of delegates, and on finance. He said a sufficient sum had been raised to cover all the expenses of the meeting.

Reports of Association Officers—The President, C.-E. A. Winslow, Dr.P.H., the Treasurer, Louis I. Dublin, Ph.D., and the Executive Secretary, Homer N. Calver, presented their annual reports in accordance with the Constitution. The President's report covered meetings and activities of the Executive Board during the year. The Treasurer stated that income for the first 9 months of the year was $74,781.55 against expenditures of $63,211.06. The total assets of the Association were $38,384.88; total liabilities $9,679.84. Income for 12 months of 1925 was $70,971.63, and expense $70,069.66. The report of the Executive Secretary will be published in full in the JOURNAL. Total assets as of December 31, 1925, were $25,147.36; total liabilities, $7,838.71.

Committee on Administrative Practice—The report was read by W. Frank Walker, D.P.H., Field Director for the Committee.

The report was accepted, and the recommendation of the Executive Board, which places the committee on a permanent basis, was approved. Under the recommendation, the committee will consist of the chairman, vice-chairman and secretary of the Health Officers Section, and the Executive Secretary of the Association, *ex officio*, and 12 members to serve for terms of 4 years each, expiring in rotation, 3 each year. The first 12 appointees, however, will serve 3 for 4 years, 3 for 3 years, 3 for 2 years, and 3 for 1 year.

Committee on Eligibility—The Executive Secretary reported that this committee had held two meetings at which 37 applications for Fellowship were considered. Thirty-three had been approved, and 4 held for further investigation. It had considered also the applications of 3 state societies for affiliation. Two Fellows had been approved for recommendation to the Council as Honorary Fellows.

Editorial Committee—It was stated that the best report for this committee is the JOURNAL itself, which has increased in size and, it is hoped, in quality. H. W. Redfield, Ph.D., former editor of the Food and Drugs Section, has been succeeded by Walter S. Frisbie, and the engineering notes are now edited by Arthur P. Miller, C.E., who succeeds Abel Wolman.

Advertising Committee—It is the aim of this committee to become a group of councilors on effective presentation of JOURNAL advertising, rather than to act as a board of censors. In this spirit, the committee has considered copy of several advertisers during the year, referred to it by the Managing Editor because some statements made seemed to him questionable for publication in a high grade professional magazine. In every case the suggestions made by the committee were acted upon promptly by the advertiser.

To Coöperate in Securing the Commissioning of Sanitary Engineers—George W. Fuller reported no definite progress, but said certain resolutions would be prepared for consideration later.

Federal Health Legislation—Professor Winslow reported the failure of the Parker Bill to meet the approval of General Lord, Director of the Budget. He said it was hoped that essentially the same bill would be introduced during the coming year and would meet with greater success.

Finance—Dr. Dublin reported progress. He said plans would continue for the sale of service to cities and to large industrial organizations.

Organization—Mr. Fuller reported the completion of the work of this committee and recommended its discharge. The committee was discontinued with the grateful thanks of the Association.

Certified Milk—Professor E. O. Jordan said the work of this committee waited on the Committee on Dairy Products, and he had no report to present.

Training and Personnel—The report was read by Professor C. E. Turner. It was accepted and its publication approved as a report of the committee and not as a representation of the policy of the Association as a whole. (The complete report will be published in a later issue of the JOURNAL.)

Time for Closing Polls for the Election of Governing Councilors and Appointment of Tellers—It was voted to close the polls at 1.00 P.M., Wednesday, October 13. The President named as tellers J. C. Geiger, M.D., chairman, Arthur Gorman and George H. Van Buren; and as assistant tellers, C. C. Young, D.P.H., Willis T. Butler, M.D., and Don M. Griswold, M.D.

Committee to Confer with Officers of the Public Health Administration Section—Professor Winslow reported the result of a questionnaire which had been sent to all health officers by L. I. Harris, M.D., requesting their opinions on the composition of the Section. Of 232 health officers addressed, 22 declared themselves in favor of a section limited to health officers of cities of 100,000 population and over, and 154 voted for a section to include all health officers. He said part of the report of this committee is represented in the Amendments to the Constitution and By-laws to be considered later by the Council. The limitation of membership in the section and a change in its name would be considered at its business meeting on Tuesday morning, October 12, and the recommendations made then would be referred to a later meeting of the Council.

Petition for a Section of Municipal Health Officers of North America—A petition bearing the names of municipal health officers from 129 cities, representing 36 states and two Canadian provinces, for a section of Municipal Health Officers of North America was presented. It was voted to table the petition for consideration after the business meeting of the Public Health Administration Section.

Committee on Dairy Products—A progress report was presented by Professor Henry C. Sherman. He said his committee construed its commission in the broadest possible way and planned to prepare a report of wide scope after adequate inquiry and careful consideration. He asked for suggestions and recommendations on the questions under consideration which include:

1. Desirable number of grades of market milk.
2. Formulation of requirements to govern the production of milk for human consumption.
3. Bacterial standards and other factors entering into the establishment and enforcement of a grading system.
4. Definition of suitable apparatus for use in the pasteurization of milk.
5. Time and temperature requirements of pasteurization.
6. The efficiency of pasteurization with reference to various types of bacteria and their products.
7. Home pasteurization *versus* boiling of milk for infant feeding.
8. Laboratory tests for sanitary quality of milk.
9. Physical examination of persons engaged in handling milk.
10. Proper attitude of health authorities regarding "remade" milk.
11. Suitability of different forms of milk for infant feeding.
12. Do pasteurization and the current methods of preservation result in any lowering of vitamin contents or other factors of nutritive value?
13. The relation of dairy products to health through nutrition.
14. Regulations and standards for dairy products other than milk.

Committee on Constitution — Henry F. Vaughan, D.P.H., *Chairman*, presented this report which involved certain amendments to the Constitution and By-laws. The most important amendments provided for an increased representation of health officers on the Council, and for an extensive revision of the relationships of affiliated societies. Under the proposed plan, all professional members of affiliated societies would be members of the American Public Health Association, and there would be a joint payment of dues in the local and national society. The amendments provided also for the creation of a council on standards to pass on all professional or technical standards proposed for adoption by the Association or any of its sections. Other amendments provided for a new method of nominating Governing Councilors and electing them, and for a new method of nominating officers of the Association. The complete Constitution and By-laws as amended appear elsewhere in this issue.

OCTOBER 11 MEETING

Election of Fellows and Honorary Fellows—Eight applications for Fellowship were approved. Victor C. Vaughan, M.D., and Charles J. Hastings, M.D., were elected to Honorary Fellowship.

Amendments to the Constitution—These were approved as published in the September JOURNAL, with one change, namely, the words "in the Public Health Administration Section" were stricken from Article III, Paragraph 5, and it was voted to recommend them to the Associaiton for adoption.

Change in Name of Public Health Administration Section—A request from this section to change its name to the Health Officers Section was presented. The Secretary was instructed to give the twenty-four hours written notice to the Council required for an amendment to the section constitution.

Amendments to the By-laws—The proposed amendments were discussed and informally approved.

OCTOBER 13 MEETING

Amendments to the By-laws—The amendments to the By-laws were adopted.

Change in Name of Public Health Administration Section—The change to the name Health Officers Section was approved.

Petitions of State Societies—Petitions from West Virginia Public Health Association, Missouri Public Health Association, and Iowa Public Health Association for affiliation were approved, subject to examination by the Executive Board to determine whether they comply with the new requirements of the By-laws.

Annual Meeting—It was voted to hold the 1927 Annual Meeting in Louisville, Kentucky.

Resolutions—The Committee on Resolutions, John A. Amyot, M.D., *Chairman*, reported seven resolutions, which were approved for submission to the general Association. (See page 1128, November JOURNAL.)

Election of Officers—Officers were elected as follows for 1926–1927: President, Charles V. Chapin, M.D.; First Vice-President, Herman N. Bundesen, M.D.; Second Vice-President, A. J. Douglas, M.D.; Third Vice-President, Francis E. Fronczak, M.D.; Treasurer, Louis I. Dublin, Ph.D.

Sedgwick Memorial Fund—Professor E. O. Jordan reported for the committee appointed to establish a memorial medal to commemorate Professor William T. Sedgwick. The sum of $2,400 was in the hands of the committee, he said, and the committee recommended that this be turned over to the Association for a permanent medal trust fund, part to be used for the preparation of a design and dies, the rest to be invested and the income to be used for striking off a medal each year. The appointment of a committee to award this medal was also recommended.

Newly Elected Governing Councilors—The following were declared elected as members of the Governing Council with terms expiring in 1929:

B. L. Arms, M.D.
S. J. Crumbine, M.D.
Haven Emerson, M.D.
Livingston Farrand, M.D.
John A. Ferrell, M.D.
A. W. Freeman, M.D.
George W. Fuller
Allan J. McLaughlin, M.D.
William H. Park, M.D.
Henry F. Vaughan, D.P.H.

Report of Committee on Communicable Diseases—It was voted to request the Executive Board to approve the publication of this report and to offer it for publication to the United States Public Health Service.

OCTOBER 14 MEETING

Executive Board—George W. Fuller, Norman MacLeod Harris, M.D., and Haven Emerson, M.D., were elected to the Executive Board.

Change of Name of Health Education and Publicity Section—An amendment to the section constitution was approved changing the name of this section to Public Health Education.

Selection of Annual Meeting City—It was voted that if the Executive Board determines that a city selected by the Council is not suitable for an Annual Meeting, it shall so report with recommendations to the Council. It was voted also to ask the Executive Board to give consideration to the method of selecting Annual Meeting cities and report to the Council.

Report of Committee on Communicable Diseases—It was voted to approve the publication of this report subject to the approval of the Council on Standards.

Time of Annual Meeting—A suggestion to hold the Annual Meeting so that it would not interfere with the school year was referred to the Executive Board.

EXECUTIVE BOARD

OCTOBER 10 MEETING

Report of Association Committees—(See Governing Council meeting October 10, page 1223.)

Financing Annual Meeting—It was voted to ask the Committee on Finance to consider this question.

Employment Bureau—It was voted to appropriate $3,000 in the budget for the year 1927 for the partial support of a placement and recruiting service.

Fellowship Certificates—The Executive Secretary reported that all Fellowship certificates had been mailed.

Applications for Unaffiliated Fellowship—Eight applications for unaffiliated Fellowship were presented, of which 7 were approved and 1 referred to a section.

Publications—It was voted to publish the membership list in the March JOURNAL. Authorization to publish the fifth edition of *Standard Methods of Milk Analysis* was given and permission to translate this report into Spanish was also given. The publication of a volume on Community Health Organization was approved.

Special Cancer Committee—It was voted to appoint a committee to consider the subject of cancer from the public health viewpoint.

OCTOBER 14 MEETING

Council on Standards—The new Council on Standards authorized by the By-laws was appointed as follows: George W. Fuller (1931), E. O. Jordan, Ph.D. (1930), Haven Emerson, M.D. (1929), Henry F. Vaughan, D.P.H. (1928), and Merrill E. Champion, M.D. (1927).

Resolution from the American Veterinary Medical Association—A resolution from this association expressing its desire to coöperate with the American Public Health Association in carrying out the ideals of food hygiene was read and the Secretary was directed to make suitable reply.

Committee to Speak for the Association on Behalf of the Parker Bill and Similar Legislation—This committee was approved and it was voted to ask the President to appoint it.

Forum Session—The Program Committee was directed to designate a chairman for the Forum Session, and to hold this session in future under the auspices of no one section.

Branch Office in Texas—It was voted to have the Executive Secretary attend the meeting of the Texas Association of Sanitarians and to report back to the Executive Board regarding the possibilities for establishing a branch office of the American Public Health Association in that state in connection with the Texas Association of Sanitarians.

SUGGESTIONS FOR CHRISTMAS GIFTS

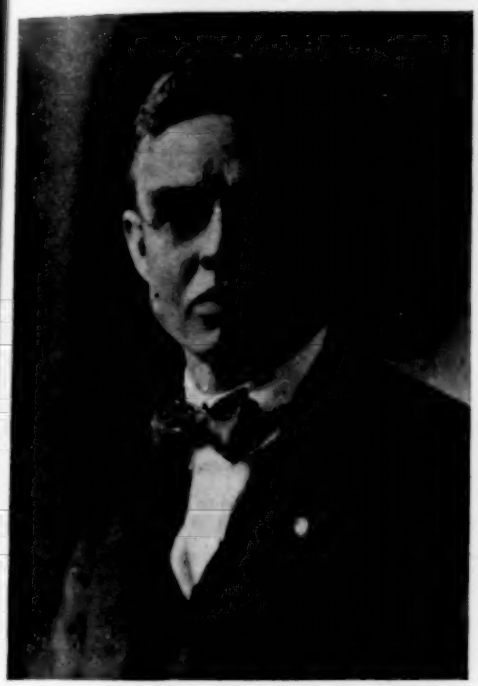
A Doctor's Memories—Victor C. Vaughan	**$5.00**
The Peaks of Medical History—Charles L. Dana	**3.00**
Education and the Good Life—Bertrand Russell	**2.50**
Hygieia or Disease and Evolution (Today and Tomorrow Series)—Burton Peter Thom	**1.00**
The National Government and Public Health—Jas. A. Tobey	**3.00**

CHILDREN'S BOOKS

The Health Guard Brownies—Nathalie Forbes Moulton	**$1.00**
Better Health for Little Americans—Edith W. Lawson	**.70**
Just Ten Minutes—Eleanor G. Griffith	**.64**
Chalk Talks on Health and Safety—Walter F. Cobb	**.80**

DR. EMMONS JOINS OUR STAFF

On December 1, 1926, Dr. Arthur B. Emmons, 2d, becomes Associate Secretary of the A.P.H.A.



ARTHUR B. EMMONS, 2D

Dr. Emmons was graduated from the Harvard Medical School in 1902, served at the Massachusetts General Hospital, Boston City Hospital, Boston Lying-in Hospital and Johns Hopkins Hospital. Dr. Emmons has been a member of the A.P.H.A. for many years. He is a director of the American Association of Industrial Physicians and Surgeons.

His earlier professional experience included 8 years of practice in Boston, chiefly in obstetrics and pediatrics. One of the early health centers was developed at the Maverick Dispensary in East Boston with Dr. Emmons as medical chief.

He served in the World War as chief of the medical service of Evacuation Hospital 2, U. S. Army, with a year of overseas service at Baccarat and Coblenz.

Recently, as director of the Harvard Mercantile Health Work, Dr. Emmons completed a 6-year study of the health of the employes of more than twenty-five stores. The results are now published in his book, *Health Control in Mercantile Life*.

Dr. Emmons will devote his time to the development of the work of several committees of the Association and much of his time will be spent in the field under the direction of the Committee on Administrative Practice.

We hope that Dr. Emmons's varied experience may be useful to the members of this Association and we welcome him into the broadening field of endeavor of the American Public Health Association.

NEW MEMBERS

Carlos R. Adams, B.S., M.D., Katonah, N. Y., Health Officer

Ernani Agricola, M.D., Minas Geraes, Brazil, S. A., State Director of the International Health Board in the State of Minas Geraes. Also Rural Health Officer (Assoc.)

Melville D. Ailes, B.S., LL.B., M.D., Sidney O., Health Commission

Matthew C. Armstrong, Hampton, Va. (Assoc.)

Ross Armstrong, Fort Worth, Texas, Director of Milk Sanitation Division

Floyd J. Atwell, M.D., Cooperstown, N. Y., Health Officer

Louise C. Ball, A.B., D.D.S., New York, N. Y., Director, International Dental Health Foundation for Children, Inc.

Don J. Barnes, M.D., Detroit, Mich., Director Child Welfare Division, Detroit Health Department

Craig Barrow, Savannah, Ga., Chief Surgeon Central of Georgia Railway, Co-Operative Health Work, Government, State, County and Cities

Eugene Bauer, M.D., Owego, N. Y., Health Officer

Bess O. Beeman, Austin, Tex., Private Secretary to Dr. H. O. Sappington, States Health Officer

Mary A. Birmingham, Glen Cove, N. Y., Health Teacher, Glen Cove Schools

John W. Bowler, M.D., A.M., Hanover, N. H., Professor of Hygiene and Physical Education, Dartmouth College

Grace Boynton, R.N., Newburgh, N. Y., Orange County Tuberculosis Nurse

Rose D. Briem, A.B., New York, N. Y., Educational Department, Postum Cereal Co., Inc. (Assoc.)

Benjamin C. Brough, Winnipeg, Can., Health Inspector

George J. Bryan, M.D., Fayetteville, N. Y., Health Officer

H. S. Bulkeley, M.D., Rhinebeck, N. Y., Health Officer

Alex M. Burgess, M.D., A.B., Providence, R. I., Assistant Professor, Brown University

A. M. Burt, M.D., Ballston Lake, N. Y., Health Officer

Roy W. Bury, M.B., Piercefield, N. Y., Health Officer

Grace D. Buzzell, Glen Head, N. Y., Public Health Nurse

Gertrude Byrne, B.S., Chicago, Ill., Instructor of Physical Education and Hygiene

Andrew Carney, M.D., Westfield, N. J., Health Officer

S. Palmer Carter, Phar.D., Altoona, Pa., Director, Bacteriological Laboratory, Penna. R. R. System
William H. Cary, Jr., C.E., Detroit, Mich., Assistant Sanitary Engineer, Detroit Department of Health
James J. Chandler, A.B., M.D., Albany, N. Y., State Department of Health, Division of Tuberculosis
Marguerite J. Clancy, R.N., Charleston, W. Va., Director Public Health Nursing Service, City Health Department
Joseph C. Clifton, Kansas City, Mo., Chief Dairy Inspector
E. Linwood Cornman, V.M.D., Marietta, Pa. (Assoc.)
Quintard A. B. Cornman, Marietta, Pa., Sales Representative for The Gilliland Laboratories (Assoc.)
John Cotton, M.D., Burnt Hills, N. Y., Health Officer
Porter J. Crawford, B.S., M.D., Troy, O., Health Commissioner
Georgiana Crenner, South Lincoln, Mass. (Assoc.)
Frank J. Cyman, M.D., Hamtramck, Mich., Health Officer
James S. Darling, Hampton, Va., Member of firm of J. S. Darling & Son, Oyster Dealers
Charles De Armas, Tampa, Fla., Director of Laboratory, Gordon-Keller Municipal Hospital
Abilio De Castro, M.D., Minas Geraes, Brazil, S. A., Assistant to the Department of Health of Minas Geraes (Assoc.)
M. Luise Diez, M.D., Albany, N.Y., Associate Director, Division of Maternity, Infancy and Child Hygiene, State Department of Health
Helen B. Donahoe, B.S., Bridgeport, Conn., Bacteriologist, City Department of Health
Anita S. Dowell, A.B., A.M., Towson, Md., Instructor in Health Education, State Normal School
E. E. Eddy, M.D., Redwood, N. Y., Health Officer
Teresa M. Fields, B.S., New York, N. Y., Organizer in Health Education, Bellevue-Yorkville Health Demonstration
Matthew J. Fitzpatrick, M.D., Mason City, Ia., Health Physician
Warren F. Fox, M.D., Pasadena, Calif., Health Officer and City Physician
Richard A. Gantz, Muncie, Ind., Teacher, Indiana State Normal School
Melrose T. Garrett, B.S., Houston, Tex., Sanitary Engineer
Louis R. Gersten, Buffalo, N. Y., Sales Agent for Seal-Kaps (Assoc.)
Manuel G. Gonzalez, M.D., Mexico City, Mex., In Charge of Tropical Diseases Section
Wyman W. Harden, M.D., St. Petersburg, Fla., Health Commissioner
Helena A. Hunt, Oneonta, N. Y., Public Health Officer of Oneonta Public Schools
Gerda M. Jacobson, R.N., P.H.N., Ogden, U., Supervisor Public Health and Social Service Department, Dee Hospital
Emilie W. Jean, B.S., Salamanca, N. Y., Public Health Nurse
T. W. Kemmerer, M.S., M.D., Jackson, Miss., Director State Hygenic Laboratory, State Board of Health
Royal E. La Grange, M.D., Fort Ann, N. Y., Health Officer
Anna B. Landon, Dolgeville, N. Y., Public Health Nursing
John E. Leonard, M.D., Harford Mills, N. Y., Health Officer
Michael Levitan, M.D., Rome, N.Y., Medical School Inspector
Morley B. Lewis, M.D., Sag Harbor, N. Y., School Inspector
R. N. Lindsay, M.D., Old Forge, N. Y., Health Officer
James H. McCort, Sag Harbor, N. Y., (Assoc.)
Anna M. McGee, R.N., Schenectady, N. Y., General Director of Public Health Nursing Association of Schenectady County
Wilbur A. McPhaul, M.D., Charlotte, N. C., Health Officer
Charlotte C. Mentzien, R.N., Buffalo, N. Y., Formerly with Buffalo Tuberculosis Association
Clarence C. Miles, M.D., Greenport, N. Y., Health Officer
Charles A. Mohr, M.D., Mobile, Ala., Health Officer
John L. Montgomery, Red Bank, N. J., Executive Secretary, Monmouth County Organization for Social Service
William J. Orchard, Newark, N. J., Sanitary Engineer Wallace & Tiernan Co., Inc.
Margaret J. Orr, R.N., Orange, N. J., Executive Secretary, Anti-Tuberculosis League of the Oranges
John S. Parker, M.D., Earlville, N. Y., Health Officer
Ethel Perrin, New York, N. Y., Associate Director, Health Education Division, American Child Health Association
Amelia H. Pfeiffer, Depew, N. Y., Public Health Nurse
George L. Ramsey, Marietta, Pa., Advertising Manager, The Gilliland Laboratories (Assoc.)
Ralph D. Reid, M.D., Schenectady, N. Y., Health Officer
J. Lynne Robertson, Jr., B.S. in C.E., Norfolk, Va., Junior Assistant Sanitary Engineer, P.H.S.
Minna M. Rohn, M.D., C.P.H., Saratoga Springs, N. Y., Formerly Professor of Health and Physical Education, Skidmore College
Ada M. Rutledge, R.N., Chattanooga, Tenn., with City Health Department
W. H. Schwartz, M.D., Colton, N. Y., Health Officer
Keith Sears, M.D., Trumansburg, N. Y., Health Officer
John A. Smith, M.D., Jackson Heights, N. Y., Medical Secretary, National Tuberculosis Association
James A. Stalbird, B.S., Santiago, Chile, Bacteriologist and Sanitary Engineer
Willard R. Starks, M.D., Chatham, N. Y., Health Officer
William G. Stedman, M.D., Rochester, N. Y., Health Officer
Henry V. Stewart, B.S., Little Rock, Ark., Director, Hygienic Laboratory, State Board of Health
B. S. Stokes, M.D., Centerpoint, Ark., County Health Officer
Earl J. Sunkes, M.Sc., Atlanta, Ga., Assistant Director of Laboratories, State Board of Health
C. K. Tomlinson, M.D., Amsterdam, N. Y., Health Officer
Lockland V. Tyler, M.D., So. Jacksonville, Fla., Public Health Officer
J. E. Vegecunt, M.D., Red Hook, N. Y., Health Officer
L. C. Warren, M.D., Franklin, N. Y., Health Officer
Lilla C. Wheeler, Portville, N. Y., Member Cattaraugus County Board of Health
Henry M. Whimster, B.A., Sault Ste Marie, Can., Inspector, U. S. Public Health Service
Anne L. Whitney, New York, N. Y., Staff Associate, Health Education Division, American Child Health Association
Genette Wierman, Olean, N. Y., Cattaraugus Board of Health, Nutrition Specialist
Agnes A. Woods, R.N., Oswego, N. Y., Industrial Nursing at the Oswego Shade Cloth Co.
Kathleen W. Wootten, A.B., Milledgeville, Ga., Professor of Health, Georgia State College for Women
Katharine Law Wright, M.D., Erie, Pa., Chief, Pa. State Tuberculosis Clinic
Preston E. Wright, M.D., Berwyn, Ill., Director, Berwyn Health District

CONSTITUTION AND BY-LAWS, AND CONSTITUTION FOR SECTIONS, AMERICAN PUBLIC HEALTH ASSOCIATION

As Amended by the Governing Council at the Fifty-fifth Annual Meeting, Buffalo, N. Y., October 11–14, 1926

ARTICLE I

NAME

The name of this Association, incorporated under the laws of Massachusetts, is the American Public Health Association.

ARTICLE II

OBJECT

The object of this Association is to protect and promote public and personal health.

ARTICLE III

GOVERNING COUNCIL

A. *Composition:* There shall be a Governing Council consisting of:

1. The officers of the Association.

2. Thirty members of the Council, to be elected by and from the Fellowship of the Association, for three-year terms, one-third retiring each year. These members of the Council shall be nominated and elected as provided for in the By-laws.

If one of these members is elected a Section Chairman, Vice-Chairman, or Secretary, or appointed the representative of an Affiliated Society, a new Councilor to fill such vacancy shall be elected.

3. The Chairman, Vice-Chairman and Secretary of each Section.

4. A representative to be appointed by each affiliated society to serve for one year. Such representative shall be at the time of his appointment a Fellow of the American Public Health Association.

5. The elective members of the Council of the Health Officers Section.

B. *Terms:* Terms of Councilors shall begin at the end of the annual meeting when elected, and shall terminate at the end of the annual meeting at expiration of term; provided that Councilors shall have the right to attend meetings of the Council in an advisory capacity as soon as elected.

C. *Reëlection:* After two consecutive terms, an elective Councilor shall be ineligible for reëlection to the Council during one Association year.

D. *The Officers* of the Association shall be the officers of the Council.

E. *Functions:* The functions of the Council shall be:

1. To establish policies for the Association and for the guidance of the Executive Board and the officers.

2. To establish Sections of the Association, to combine or discontinue them when necessary, to maintain coördination among them, and to formulate general rules governing the policies of the Sections.

3. To submit to the vote of the Association all resolutions which have received the approval of the Governing Council.

4. To elect Affiliated Societies, Fellows and Honorary Fellows as provided in the By-laws.

5. To elect the Executive Board and the officers of the Association.

6. To receive from the President, on behalf of the Executive Board, a report of the meetings, policies and work of the Executive Board; a report from the Executive Secretary concerning the administrative work of the year; and a report from the Treasurer concerning the finances of the Association.

F. *A Quorum* of the Council shall consist of ten Councilors.

G. *Meetings* of the Council shall be called by the Executive Secretary at the request of the President, or at the request in writing of any twelve Councilors. In the latter case, the call to meeting, issued at least twenty days in advance, shall state the purpose of the meeting.

ARTICLE IV

OFFICERS

The officers of this Association shall be a President, three Vice-Presidents, an Executive Secretary, and a Treasurer. The officers, with the exception of the Executive Secretary, shall be elected by written ballot of the Governing Council as provided in this article and in the By-laws. Officers shall serve from the close of the annual meeting when elected, until the close of the next annual meeting, and until their successors are elected and qualified. A majority vote of the Councilors voting shall be required to elect, and if no candidate receives a majority vote on the first ballot, the candidate receiving the smallest number of votes shall be dropped after each ballot in succession until a majority vote is obtained. The Executive Secretary shall be elected by and serve at the pleasure of the Executive Board.

ARTICLE V

AMENDMENTS

This Constitution may be amended by a two-thirds vote of the Members of the Association present and voting at an annual meeting, provided that the specific amendment to be acted upon is published in the official publication of the Association not less than thirty days prior to the meeting, and provided further that the amendment has received the approval of the Governing Council.

BY-LAWS

ARTICLE I

MEMBERSHIP AND DUES

A. There shall be a standing Committee of the Governing Council on Eligibility, consisting of one Fellow from each established Section to be appointed by the President, with terms of three years each, as equal a number as possible expiring each year, the terms of those first appointed to be determined by lot conducted by the Executive Board; this committee to perform such duties as may be specified herein, and such other duties as may be assigned to it from time to time by the Governing Council.

B. There shall be seven classes of constituents who may be elected from the United States, Canada, Mexico, Cuba, and such other countries as may be admitted to representation in the Association. This provision shall not apply to Honorary Fellows or Associate Members. The respective appellations, qualifications for election, and dues shall be as follows:

1. *Fellows:* Only professional health workers, who have been Members of the Association for at least two years, and of established professional standing (whether employed by public or private agencies or in independent private practice) shall be eligible for election as Fellows, provided that a Member shall be not less than thirty years old at the time the application for Fellowship is made, and provided, further, that the following persons shall be considered to have an established standing in the profession of public health, namely:

a. A person who has attained the degree of Doctor of Public Health, Doctor of Science in Public Health, Doctor of Philosophy in Public Health, or other equivalent degree, according to standards approved by the Executive Board of the American Public Health Association.

b. A person who has attained an academic or professional degree involving training in public health, and who has been regularly engaged in public health work for four years, having rendered meritorious service in the public health profession, either as a health officer or in responsible charge of work in a state or municipal department of health or other official public health organization.

c. A person who has done notable original work in public health or preventive medicine of a character to give him a recognized standing equivalent to that required for Fellows under paragraphs "a" and "b."

d. A person regularly engaged in public health work for at least five years, who has given evidence of special proficiency in the service of an official or unofficial public health organization, and who has attained a professional standing equivalent to that required for Fellows under paragraphs "a" and "b."

e. A teacher of public health or one of its constituent sciences. As such he shall have attained distinction as an expounder of the principles of public health or its constituent sciences and he shall have had at least five years' experience as a teacher of public health subjects. Any years of experience as defined in paragraphs "b" and "d" that the applicant may have had shall be considered the equivalent of the same number of years experience as a "teacher."

f. A person not covered by the above, who has made substantial contributions to public health work in his chosen branch of public health service, and who has attained a professional standing equivalent to that required for Fellows under paragraphs "a" and "b."

The application for Fellowship shall be made on an approved form and shall be sponsored by two Fellows of the Association who shall be Fellows of the Section with which affiliation is desired, provided, however, that when affiliation with a Section is not desired, the sponsors may be any two Fellows in good standing in the Association. Fellows without Section affiliation shall be known as unaffiliated Fellows.

When the application has been duly sponsored and otherwise completed, it shall be transmitted to the Executive Secretary of the Association, who will make note thereon of such knowledge as he may have concerning the standing of the applicant in the Association. The application shall be forwarded by the Executive Secretary to the Secretary of the Section in which affiliation is desired, for the approval of the Section Council, and when acted upon by the Section Council, it shall be returned to the Executive Secretary by the Secretary of the Section, after he has made endorsement on the application of the action of the Section Council. When the application is for unaffiliated Fellowship, the Executive Board of the Association shall act in place of the Section Council. When the application has been approved by a majority of the Section Council or the Executive Board, as above provided, it shall be voted upon by the Governing Council, provided the name of the applicant shall have been officially published at least fifteen days in advance, and provided further that the application shall have been approved by the Committee on Eligibility.

A Fellow may belong to and vote in only one Section, but such affiliation may be transferred to another Section if approved by vote of a majority of the Council of the latter Section. Unaffiliated Fellows may become affiliated with a Section if approved by vote of a majority of the Council of the Section in which affiliation is desired.

The right to vote and to hold office or to serve as chairman of a committee in the Association shall be limited to the Fellows of the Association, whether Section Fellows or unaffiliated Fellows. The right to vote and to hold office or to serve as chairman of a committee in a Section shall, however, be limited to the respective Fellows in such Sections.

The dues of Fellows shall be $10.00 per year.

2. *Honorary Fellows:* Honorary Fellows may be elected by the Governing Council for distinguished service in public health. Honorary Fellowship shall not include voting power or payment of dues.

3. *Members:* Persons professionally engaged in public health work shall be eligible for election as active Members when sponsored by two Fellows of the Association. They may serve

committees, except as chairmen. Dues $5.00 year. A Member may belong to only one ction but such affiliation may be transferred another Section if approved by vote of a jority of the Council of the latter Section. affiliated Members may become affiliated th a Section if approved by vote of a ma- rity of the Council of the Section in which filiation is desired.

4. *Associate Members:* Persons interested in blic health shall be eligible as Associate embers. They may serve on committees, ex- pt as chairmen. Dues $5.00 per year.

5. *Sustaining Members:* Individuals or cor- rations interested in public health may be ected to Sustaining Membership. Dues $50.00 more per year.

6. *Affiliated Societies:* A state or provincial blic health association or similar regional ciety including more or less than a state, imarily composed of professional public alth workers and organized for the same neral objects as the American Public Health sociation may be elected as an Affiliated ciety, provided that not less than twenty of s active members and at least one-half of its tive members are Members or Fellows of e American Public Health Association. Not ore than one such society shall be admitted om the same area.

A society applying for affiliation shall submit copy of its constitution and by-laws, its last nual budget, a roster of its members and ch other evidences of its qualifications as it ay desire to submit.

The Committee on Eligibility shall consider ll applications for affiliation and report its commendations to the Governing Council.

The dues of Affiliated Societies shall be $1.00 er $1,000.00 of their annual budget, the maxi- um dues per society being $100.00 and the inimum $10.00 per year.

Each Fellow, Member, Associate Member, nd Affiliated Member of the American Public ealth Association shall be a member of the ffiliated Society to which he is eligible and, fter January 1, 1927, no person eligible for lection to an Affiliated Society shall be ad- mitted to Membership, Associate Membership r Affiliated Membership in the American Pub- ic Health Association unless such person has qualified or at the same time qualifies as a member of an Affiliated Society.

For every Fellow, Member, Associate Mem- ber or Affiliated Member paying annual dues to the American Public Health Association, the American Public Health Association shall remit to the Affiliated Society of which such person is a member the sum of $1.00 per annum.

7. *Affiliated Members:* This class of mem- bership shall include all active (namely pro- fessional) members of Affiliated Societies, and in areas where no Affiliated Societies exist such other professional sanitarians as may be elected to this grade. Dues $1.00 per year.

C. *Election:* The election of Fellows (see A1 above), Honorary Fellows and Affiliated Societies shall be by the Governing Council.

The election of Members, Associate Members, and Sustaining Members shall be by a committee appointed by the Executive Board.

Three-fourths of the votes cast shall be requisite for election.

Upon the recommendation of the Committee on Eligibility the Governing Council may dis- continue the Membership, Fellowship or affilia- tion of any constituent. Three-fourths of the votes cast shall be necessary for such action.

D. *Dues:* Dues are payable annually in ad- vance. All constituents paying dues shall be entitled to receive the AMERICAN JOURNAL OF PUBLIC HEALTH and, or, such other publica- tions as may be designated by the Executive Board, which shall determine the proportion of dues to be devoted to this purpose.

Constituents of any class whose dues are unpaid for six months or more shall be con- sidered not in good standing. Constituents not in good standing shall not be entitled to vote, hold office or enjoy other privileges or powers of membership. Good standing may be resumed upon the payment of all arrears and dues in advance for one year, provided, however, the lapsed period is not greater than one year. The Executive Secretary shall notify by registered mail all constituents who have been in arrears for a period of eleven months. The names of constituents in any class whose dues remain unpaid for one year or more shall be presented to the Executive Board which shall order the names of such constituents stricken from the Membership roll, provided, however, such con- stituents have been duly notified as herein- before provided in this paragraph. Constitu- ents whose names have been stricken from the rolls in this manner may be again admitted upon the payment of all arrears and in the manner provided for the election of new con- stituents in the class for which they make application provided such person or organiza- tion complies with the eligibility requirements at the time the new application is made.

ARTICLE II

GOVERNING COUNCIL

At least four months before the Annual Meeting the President with the approval of the Executive Board shall name a Nominating Committee of not less than three Fellows, no two of whom shall be from the same Section of the Association or the same state. This committee shall present to the Executive Secre- tary at least two months before the next Annual Meeting the names of at least twenty and not more than thirty Fellows of the Association selected with due regard to geographical and Membership considerations as nominees for the Governing Council. The Executive Secretary shall publish this list to the Membership. Upon the petition of twenty-five Fellows the Nomi- nating Committee shall add the name of any Fellow to this list provided such petition is received fifteen days before the Annual Meet- ing. The time for closing the polls shall be determined each year by the Executive Board. The ten Fellows receiving the highest number of votes on a written ballot cast by the Fellows present and voting at the Annual Meeting shall

be declared elected. Should two or more candidates receive the same number of votes the Executive Board shall, when necessary, determine by written ballot the order of precedence.

ARTICLE III

EXECUTIVE BOARD

A. *Composition:* There shall be an Executive Board of nine members elected by the Governing Council, six of whom shall be members of the Governing Council, and three of whom shall be the President, retiring President, and Treasurer.

B. *The Terms* of the President, retiring President, and Treasurer as Executive Board members shall be one year each, and the terms of the other members shall be two years each, expiring in rotation, three each year. These terms shall begin at the end of the annual meeting at which elected, and shall continue until the end of the annual meeting at expiration of term, provided that newly elected members of the Board shall have the right to attend meetings as soon as elected, and shall have no vote until installed.

C. *Reëlection:* After two consecutive terms a member of the Executive Board shall be ineligible for reëlection during one Association year. This provision shall not apply to an officer of the Association.

D. *The Officers* of the Association shall be the officers of the Executive Board.

E. *Duties:* The duties of the Executive Board shall be:

1. To direct the administrative work of the Association.
2. To act as trustee of its properties.
3. To procure funds and to authorize budgets for the Association work.
4. In general to carry out the policies of the Governing Council between meetings of the latter.

F. *A Quorum* of the Executive Board shall consist of four members.

ARTICLE IV

OFFICERS

The officers elected by the Governing Council shall be nominated from the floor.

ARTICLE V

MEETINGS OF THE ASSOCIATION

There shall be at least one annual meeting of the Association, held at a place to be selected by the Governing Council. Special meetings of the Association may be called by a majority vote of the Governing Council, the Executive Board, or the Association.

ARTICLE VI

SECTIONS

Sections shall elect their own officers. They shall conduct sessions in coöperation with and under the supervision of the Executive Board. The Constitution and By-laws of Sections and amendments thereto shall be submitted for the approval of the Governing Council, and shall be valid only after such approval.

ARTICLE VII

PUBLICATIONS

All publications of the Association and of its Sections shall be issued under the direction of the Executive Board. The Executive Board shall appoint a Managing Editor of the official journal, who may also be the Executive Secretary of the Association. The Executive Secretary shall, with the approval of the Executive Board, appoint an Editorial Board of not less than five members, to serve at the pleasure of the Executive Board. All papers and reports for the annual meetings are to be accepted with the understanding that they shall be the property of the Association for publication, unless this right is waived by the Managing Editor.

ARTICLE VIII

STANDARDS

There shall be a Council on Standards which shall be designated by the Executive Board. Any resolution, report or publication which undertakes to establish in the name of the Association or any of its Sections professional or technical standards, shall be submitted to the Council on Standards. The Council shall give notice by publication to the Membership of all proposed standards and report its approval or disapproval of such proposed standards to the Governing Council.

Proposed standards approved by a three-fourths vote of the Governing Councilors voting shall become official standards of the American Public Health Association.

ARTICLE IX

FINANCES

The Executive Secretary shall receive and deposit to the account of the Treasurer all remittances sent to the Association. The Treasurer shall be custodian of investments of the Association and shall disburse funds in accordance with duly authorized vouchers. With the approval of the Executive Board he may establish a drawing account for the Executive Secretary. The Executive Secretary shall send each month to members of the Executive Board a financial summary of receipts and disbursements. Once each month, or oftener if called for, he shall also forward to the Treasurer and President an itemized statement of all expenditures. The Executive Secretary and the Treasurer shall be bonded at the expense of the Association in an amount to be determined by the Executive Board. The books of the Association shall be audited annually by certified public accountants, to be appointed by the Executive Board.

ARTICLE X

COMMITTEES

Committees of the Association shall be authorized by the Governing Council or the Executive Board. The President shall appoint the members of such committees. Such appointments expire at the next annual meeting, unless otherwise specified.

ARTICLE XI
AMENDMENTS

These By-laws may be amended by a majority vote of the total membership of the Governing Council during the annual meeting, provided that twenty-four hours prior written notice thereof has been given. The By-laws may further be amended by a two-thirds vote of those voting at any meeting of the Governing Council called for the purpose; provided that notice thereof shall have been given at least fifteen days prior to such meeting.

CONSTITUTION FOR SECTIONS

ARTICLE I
NAME

The name of this body shall be the ..... Section of the American Public Health Association.

ARTICLE II
SCOPE OR OBJECT

(To be stated briefly for each Section.)

ARTICLE III
MEMBERSHIP

A. *Voting Power:* The right to vote and hold office or to serve as the chairman of a committee shall be limited to Fellows of this Section who have been elected under the By-laws of the Association.

Members may participate in the scientific sessions of any Section and may affiliate with any one Section. They may serve on committees except as chairmen, but shall not vote or hold office.

B. *Payment of Dues* in the Association is a prerequisite to Section Fellowship, and nonpayment of dues shall invalidate Section Fellowship and Membership.

ARTICLE IV
SECTION OFFICERS

A. *The Officers* of this Section shall be a Chairman, a Vice-Chairman, and a Secretary. These three officers shall be the representatives of the Section to the Governing Council of the Association.

B. *Terms:* New terms begin and old terms expire at the end of annual meetings. After four consecutive years in any elective Section office, except that of Secretary, a member shall be ineligible to reëlection to that office during one Association year.

C. *The Chairman* shall preside at meetings of the Section and of the Section Council, and shall be Chairman of the Committee on Program, and of the Committee to advise on Publication of Papers in the AMERICAN JOURNAL OF PUBLIC HEALTH.

D. *The Vice-Chairman* shall preside at meetings of the Section and of the Council in the absence of the Chairman, and he shall be a member of the Section Council.

E. *The Secretary* of the Section shall keep the minutes, and other records of the Section and of the Section Council; and shall transmit to the Executive Secretary of the Association a copy of the minutes of both business and scientific sessions as soon as practicable thereafter. When unable to be present at meetings, he shall thoroughly instruct a substitute as far in advance of the meeting as possible.

The Secretary of the Section shall be ex-officio a member of all Section committees.

The Section Nominating Committee shall renominate capable Section Secretaries whenever practicable, in the interest of continuity in Section work and policies.

ARTICLE V
NOMINATION AND ELECTION

A. *Nominating Committee:* The Section Chairman, with the advice of the Executive Committee of the Section, shall appoint a Committee on Nominations at least fifteen days before each annual meeting. The Section Secretary shall be a member of such Committee.

The Committee on Nominations shall present, not later than the second meeting of the Section, at each annual meeting of the Association a list of nominees for the Section offices, and for membership in the Section Council; provided, that if the name of any Fellow be transmitted to the Section Secretary over the signature of ten Fellows of the Section at least fifteen days in advance of an annual meeting, the Nominating Committee shall add the name of such Fellows to its own list of nominees. No nominations shall be made from the floor of the meeting. Election shall be by the Fellows of the Section.

Should the Section Chairman fail to appoint a Committee on Nomination as above provided, such a committee shall be appointed for the Section by the President of the Association.

ARTICLE VI
SECTION COUNCIL

A. *Composition:* There shall be a Section Council composed of the three officers and from three to six elective members, who shall be Fellows of the Section.

B. *The Terms* of elective Councilors shall be two years each and shall expire in rotation. Terms of Councilors shall begin immediately after the annual meeting when elected; provided that Councilors shall have the right to attend meetings of the Council in an advisory capacity as soon as elected.

C. *Duties:* The duties of the Section Council shall be:

1. To act in the capacity of a board of directors for the Section.

2. To supplement the Section in authorizing the appointment of committees by the Section Chairman, and to advise in the selection of personnel.

3. To act as a Committee on Resolutions for the Section.

4. To nominate Fellows for election under the By-laws of the Association.

D. *Executive Committees:* Between annual meetings, the Section officers shall act as an Executive Committee of the Section Council.

E. *Meetings:* At least one meeting of the Council must be held at the annual meeting of the Section. Interim meetings may also be called by the Section Chairman.

F. *Attendance:* Absence from two consecutive annual meetings, or failure to answer two consecutive official communications on Section business requiring reply, shall be equivalent to resignation from the Council, subject to reinstatement by the Council if good cause is furnished.

ARTICLE VII

SECTION COMMITTEES

A. *Authorization:* Committees of the Section may be authorized by the Section or by the Section Council.

B. *Appointment:* Appointment of committee personnel shall, unless otherwise specified, be by the Section Chairman with the advice of the Section Council.

C. *Reports:* All scientific reports, upon presentation to the Section, shall be referred by the Chairman to the Section Council, or to a special reference committee which shall report back to the Section. The Section shall then vote on each report whether or not to adopt. In case of failure of the Section to take definite action before the end of the annual meeting, such duty shall devolve upon the Section Council.

ARTICLE VIII

PROGRAMS

A. *The Programs of the Section* shall be prepared by a committee including the Section officers. The committee shall also inform the editor of the official journal as to papers and reports which, in the opinion of the committee, merit publication.

B. *Standards:* All programs shall be prepared under the standards established by the Central Committee on Programs of the Association, composed of the Program Chairmen of all Sections and the President and Secretary of the Association.

C. All Section Papers and reports shall automatically become the property of the Association for publication purposes, except as this right is waived by the Managing Editor.

ARTICLE IX

AMENDMENTS

Amendments to this Constitution may be made only by the Governing Council of the Association, and in the same manner as the By-laws of the Association; provided, that the Section may adopt By-laws not in conflict with this Constitution.

BOOKS RECEIVED

COPROLOGIE MICROSCOPIQUE. By Langeron & Rondeau Du Noyer. Paris: Masson et Cie, 1926. 132 pp. Price, $.48.

LES ENTEROPATHIES MICROBIENNES. By G. Sanarelli. Paris: Masson et Cie, 1926. 227 pp. Price, $.80.

A DOCTOR'S MEMORIES. By Victor C. Vaughan. Indianapolis: Bobbs-Merrill, 1926. 464 pp. Price, $5.00.

BACTERIOLOGY. By Conn and Conn. (3d ed.) Baltimore: Williams and Wilkins, 1926. 453 pp. Price, $4.00.

THE STUDENT WHO SMOKES. By J. Rosslyn Earp, M.A. Yellow Springs, Ohio: Antioch Press, 1926. 61 pp. Price, $1.00.

SOLVING SEWAGE PROBLEMS. By George W. Fuller and James R. McClintock. New York: McGraw-Hill, 1926. 548 pp. Price, $6.00.

PROBLEMS OF HUMAN REPRODUCTION. By Paul Popenoe. Baltimore: Williams & Wilkins, 1926. 218 pp. Price, $2.50.

THE IMPORTANCE OF DIET IN RELATION TO HEALTH. The People's League of Health Lectures. London: Routledge & Sons, 1926. 130 pp. Price, 3/6.

PROHIBITION AT ITS WORST. By Irving Fisher. New York: Macmillan, 1926. 255 pp. Price, $1.75.

THE THEORY OF THE GENE. By Thomas Hunt Morgan. New Haven: Yale University Press, 1926. 343 pp. Price, $4.00.

OEUVRES DE PASTEUR. Volume IV. By Pasteur Vallery-Radot. Paris: Masson et Cie, 1926. 761 pp. Price, $5.60.

HYGIEIA OR DISEASE AND EVOLUTION. By Burton Peter Thom, M.D. New York: Dutton, 1926. 107 pp. Price, $1.00.

DISEASES OF THE TEETH. Their Diagnosis and Treatment. By John Albert Marshall, D.D.S. Philadelphia: Lea & Febiger, 1926. 331 pp. Price, $4.50.

THE JOURNAL OF PREVENTIVE MEDICINE. Vol. I. No. 1. Published bi-monthly. Chicago: John McCormick Institute for Infectious Diseases, 1926. Subscription price, $5.00 per volume. Foreign, $5.80. Single copies, $1.00.

HYDROGEN ION CONCENTRATION. (2d ed. rev.) By Leonor Michaelis, M.D. Baltimore: Williams & Wilkins, 1926. 299 pp. Price, $5.00.

THE MEANING OF DISEASE. By William A. White. Baltimore: Williams & Wilkins, 1926. 220 pp. Price, $3.00.

REPORT ON AN INVESTIGATION OF THE POLLUTION OF LAKE MICHIGAN IN THE VICINITY OF SOUTH CHICAGO AND THE CALUMET AND INDIANA HARBORS. 1924–1925. By H. R. Crohurst and M. V. Veldee. Washington, D. C.: U. S. Public Health Service.

GUIDANCE OF CHILDHOOD AND YOUTH. Readings in Child Study. Edited by Benjamin C. Gruenberg. New York: Macmillan, 1926. 324 pp. Price, $1.50.

BOOKS AND REPORTS

Guérir est bien Prévenir est mieux—*L'effort Réalisé en Hygiene et en Médicine Sociales—Dans le Department de Muerthe-et-Moselle. Louis Spillman and Jacques Parisot. Nancy, France: Berger-Levrault,* 1925. 293 pp. Price, 25fr.

However true may have been the remark, "La santé publique en France est une façade derriere laquelle il n'y a rien" (Public health in France is a façade behind which there is nothing), in the days before the war, any one who has had the privilege of observing the post-war efforts of the French knows that these efforts have not been limited solely to the reconstruction of homes and industrial plants in those regions devastated by the invasion. Against those forces which threatened the very existence of the French nation, the conservation of the public health has been built up to the point where it ranks as one of the strongest elements of resistance to this destructive process. The existence and operation to-day of 520 tuberculosis dispensaries where before the war there were but 8 or 10, to cite but one bit of evidence, is a clear indication of the fact that the present structure of the public health organization is not now the hollow shell it was earlier claimed to be.

In the final record of public health organization and accomplishment in France, the experiences in the Meurthe et Moselle as described in this book will form a brilliant chapter.

The story is developed under five headings:

1. General public health organization
2. The campaign against tuberculosis
3. The campaign against syphilis
4. The campaign against cancer
5. The campaign against infant mortality

A sixth part provides a *documentation* concerning the functions of the various public and private health and welfare agencies.

That these campaigns are already producing favorable results is the encouraging claim made by the authors in the preface: The birth rate is increasing; infant mortality, tuberculosis and syphilis are diminishing; cancer, however, appears to be increasing, as elsewhere.

The authors repeatedly emphasize the fact that they realize they are building the structure of public hygiene on a weak foundation. Statistics of illness and cause of death are, in general, woefully inadequate in France, but the contention that the official statistics show at least minimum conditions and that they are bad enough to warrant organized official action, appears just and proper. It is encouraging to note that in their zeal to build up an effective armament against disease, a serious effort is being made at the same time to improve the *statistique sanitaire*. (In this connection, the reviewer would again recommend to the authors and to other public health leaders in France a sympathetic study of the confidential system of reporting causes of death in Switzerland.)

The important rôle now played by the public health nurse (*visiteuse d'hygiene*); by educational methods, including health lectures, films and pamphlets, and the numerour references to the aid of the Rockefeller Foundation at the time when the post-war reconstruction was starting and when help was so welcome, will be of especial interest to American readers.

The book is generously illustrated with photographs, architect's drawings and charts.

THOMAS J. DUFFIELD

Broad-casting Health in China— *By W. W. Peter, 23 Yuen Ming Road, Shanghai: Council on Education,* 1926. 90 pp.

This publication of the China Council on Health Education is a thrilling account of actual accomplishment in the face of appalling difficulties. For the past fifteen years, the author, a nationally recognized leader, has been at work among China's millions, "sowing the seeds of public health."

Reading the graphic pages of this book, we seem to walk the crowded streets and narrow lanes of Chinese cities and villages, and look upon such utter lack of sanitation, such ignorance and disregard of common

hygienic laws, that we wonder whether any power on earth is great enough to cope adequately with these difficulties. Methods used with success in other countries would fail here. The printed page loses power amid illiterate throngs. Paralyzing superstitions connected with religious rites must also be reckoned with.

With admiration for his indomitable courage, we follow the author through the years of this record as he gathers about him a staff of trained Chinese young people, imbues them with his own faith that the impossible can be achieved, and then watch the changes that take place in the wake of these workers.

Cities placarded with posters, moving pictures exhibited indoors and out, apparatus demonstrating the spread of disease carried through the streets with megaphone attendants explaining to curious throngs following, and then—possibly the most effectual of all—institutes held for the training of public school teachers in this work of health education.

Although the known results are already amazing, Dr. Peter refers to all this as but "beginnings," and expresses his hope for "a large harvest" when these activities for producing a health conscience in China are no longer harassed by lack of personnel or cramped by shortage of funds. Here is both vision and action, meeting a great need.

HELEN ELGIE SCOTT

Essays in the History of Medicine—*By Karl Sudhoff, M.D., Professor of History of Medicine, University of Leipzig, 1895–1924. Translated by various hands and edited, with foreword and biographical sketch, by Fielding H. Garrison, M.D., Lieutenant-Colonel, Medical Corps, U. S. Army. New York: Medical Life Press,* 1926. 397 pp. Price, $5.00.

It is impossible to give a better idea of this book than is contained in the foreword by the editor, who with eleven others has translated these essays. Most of the essays were originally published by Professor Sudhoff under the title "Sketches" in 1921, on the occasion of his wife's birthday. Some of the original articles in that book have been omitted and later ones substituted as being of more interest to American physicians. The thirty-eight chapters cover an equal number of subjects, most of them unrelated to others except in a very general way. Sudhoff himself has described the present collection as a "nosegay of many colors," and so it may be considered. Each, however, bears the indelible impress of his method of seeing and then presenting historical matters.

The book proper opens with an exceedingly interesting "Biographical Sketch" by the editor, which gives us a view of the stupendous life work of a man who is the acknowledged world leader in medical history.

While every chapter is full of interest, those on Medical History, Hygiene and Epidemiology will probably appeal to the readers of this JOURNAL especially.

There is nothing worthy of criticism in this charming series of essays, nor in the way in which they have been presented. It might be suggested that in this day when the classics have fallen into greater or less disrepute, and the study of languages is not insisted upon in our universities and many colleges, there are too many quotations in Latin, Greek and German, which are not translated, though many of these are titles which may be guessed.

The book is delightful and should go far to inculcate a love of the history of medicine in the people of this country. In the bustle and press of modern life, too few physicians take time to read such books, which would give them many happy hours free from the cares of practice—true rest and recreation.

The make-up of the book from every standpoint is unusually good. It is beautifully printed on light paper and very free from errors. An excellent photograph of Sudhoff fronts the title page.

M. P. RAVENEL

Report of an Investigation of the Pollution of Lake Michigan in the Vicinity of South Chicago and the Calumet and Indiana Harbors. 1924–1925—*By H. R. Crohurst and M. V. Veldee. Washington, D. C.: U. S. Public Health Service,* 1926. 69 pp. 105 maps, tables and charts.

In the summer of 1924 the Trustees of the Sanitary District of Chicago, the Commissioner of Health of the City of Chicago, the Director of Health of the State of Illinois, and the Commissioner of Health of the State of Indiana, jointly requested the Surgeon General of the Public Health Service to coöperate with them in the study of the sewage pollution of Lake Michigan in the area adjacent to the so-called Calumet District lying partly in Illinois and partly in Indiana. This request was

granted and after certain preliminary surveys work was begun on September 18, 1924, under the immediate direction of Sanitary Engineer H. R. Crohurst, continuing until October 31, 1925. The report of the investigation in mimeograph form has just recently been released.

Referring to the report the study was intended to comprise the following:

1. Sanitary survey of the drainage area of the Calumet River, bringing together such data as were already available from various sources and supplementing these by additional field surveys as required.

2. The bacteriological study of the waters of Lake Michigan in this region and of the public water supplies taken from it.

3. The collection and analysis of available data relative to the influence of existing pollution of these water supplies upon the public health.

A general discussion of the investigation, together with a statement of previous sanitary investigations, are first offered. Included in this first section are discussions of the influencing meteorological conditions, lake elevations and currents, and ice covering.

Important data concerning industrial wastes are given in the second section which covers the survey of existing sources of pollution in the district under study.

The summary of the investigation of industrial plants states:

"A total of 123 industrial plants was surveyed in the Calumet District. One hundred and nine of these discharge practically no offensive waste liquids; water being used only for condensing and cooling purposes in the power plants or for cooling in manufacturing processes, either in closed systems or in contact with products from which little offensive or taste-producing substances could be derived.

"The remaining 14 plants which discharge wastes of sanitary significance may be divided into two groups. One group includes plants discharging wastes containing appreciable amounts of organic material that might, under certain conditions, give rise to nuisances near the point of discharge. The second group includes plants discharging wastes containing possible taste-producing substances which affect water supplies, especially where chlorine is used in the treatment process."

The survey of sanitary sewerage is summarized in a table which sets forth the approximate distribution of sewered population in the Calumet District.

Physical, chemical and bacteriological examinations of the waters of Lake Michigan are covered in the third section of this report in considerable detail. Discussions of the methods used for collecting and examining samples, as well as the laboratory technic and methods followed in computing plate counts and *B. coli* index are given. Following this there are discussions of the results of the various examinations made, as well as the different factors having a bearing on conditions existing. Several pages are devoted to findings as related to the bacteriological quality of municipal water supplies taken from the lake.

Conclusions drawn are short and concise and will, therefore, be taken directly from the report:

"The pollution of Lake Michigan by sanitary sewage and industrial wastes discharged from the Calumet District in Illinois and Indiana, especially from Indiana, is such as to render the sources of water supply now used by Hammond, Whiting and East Chicago unfit for that purpose, even with elaborate and efficiently operated purification plants.

"The source of water supply of Gary, Indiana, though lying outside of the zone of grossest pollution, is also seriously contaminated but not beyond the capacity of modern purification processes to safeguard it.

"The water supplies drawn by the city of Chicago from the 68th Street and Dunne cribs are also affected and at times may be seriously endangered by sewage pollution from the Calumet District.

"The water supplies taken from the lake north of the Chicago River appear to be beyond the zone of pollution from the Calumet District and are receiving water of such quality that it can be satisfactorily purified by artificial processes, excepting the supplies of Waukegan and Lake Forest. Although the pollution of these latter supplies is in no way chargeable to the Calumet District, and its discussion is beyond the scope of this report, the existing pollution in this area of the lake, north of the Sanitary District of Chicago, obviously demands attention and abatement.

"If the use of the lake as a source of water supply for the urban population in the area south of the Chicago River is to be continued, as seems inevitable, it is necessary, in the interest of public health, that the water supply intakes be protected. To remove the intakes beyond the zone of at least occasional gross pollution would require their extension very

far into the lake, to a distance which is probably not practicable.

Moreover, in the absence of remedial measures it is to be anticipated that the existing zone of pollution would be extended, with increase in the population and development of the adjacent land area. Therefore, the obvious remedy for the present intolerable situation is abatement of the existing pollution of the lake. The choice of methods to achieve this end involves engineering and economic problems which it is not within the province of this report to discuss. There is no question, however, that abatement of the existing pollution is possible, notwithstanding the difficulties which it may present; and it is certain that the need is imperative."

The appendices of the report include 29 tables and 27 diagrams, the title of each is given in the index and is descriptive of the data contained in the table or shown in the diagram. ARTHUR P. MILLER

Malignancy and Evolution: A Biological Inquiry into the Nature and Causes of Cancer—*By Morley Roberts. London: Eveleigh Nash & Grayson,* 1926. 319 pp. Price, 18s.

With the usual facility of the novelist, Mr. Morley Roberts presents his views on a wide range of subject matter. He attacks with zest and enthusiasm a problem which, at the present time, is one of the most vital, drawing inspiration from his studies in the field of sociology, since those studies suggested to him the striking analogies between pathological conditions in animals and similar conditions in nations and societies.

In presenting his belief that there exists a definite relation between social and somatic phenomena, he treats cancer as a "biological disease" and a "developmental disorder," and holds that "morbid change of any character is a variation." His clever postulate of "hostile symbiosis," or armed neutrality, which he believes is as readily applicable to the animal body (considered as a society of many millions of small units) as it is to all massed communities, forms the foundation of his theory of the cause of tumor growth. "Malignancy," he says, "is a phenomenon of reversion in which inhibited anti-social tendencies once more display themselves." This implies a certain loss of endocrine stability subsequent to placing the organism in unnatural conditions, substituting new and unfavorable ones. The endocrine glands, both as regulators of metabolism and as directors of somatic energy, may bring about a "resumption of an early morbid evolutionary cause of overgrowth which had been temporarily overcome and physiologized." Arguments are cleverly presented for his belief that growth of any kind is a definite response to conditions of disorder, whether it occurs in response to evolutionary stimuli, to abnormal irritation, or to a weakening of restraint due to some local infection.

The book gives the impression that the author had two objects in view—to reconcile tumor formation with any evolutionary process, making the whole problem one of normal physiological development; and to show that there is a definite place for a treatise of a philosophical, semi-scientific nature, on a subject the real issue of which he conceives as being obscured by the limited viewpoint of the great majority of highly specialized research men. He regrets the lack of the philosophical scientific mind, and believes the physician should be devoted not only to "pathological medicine" but likewise to "physiological society."

The book is verbose, but interesting. It is well printed and the general make-up is excellent. M. P. RAVENEL

A Directory of Sanatoria, Hospitals, Day Camps and Preventoria for the Treatment of Tuberculosis in the United States—*Compiled by the National Tuberculosis Association, 370 Seventh Avenue, New York City.* 1926. 132 pp. Price, $1.00.

In the foreword of this directory is the following statement: "Since the publication of the first tuberculosis directory in 1904, the number of beds for tuberculosis patients in the United States has increased from less than 8,000 to 67,270 (not including over 3,000 beds in institutions now under construction), and the number of sanatoria from 100 to 600."

The tuberculosis institutions are listed by states and the total number of beds available is given. The number and character of the institutions are also included, and are divided into four classes: 312 public (38,097 beds); 96 private (5,342 beds); 412 semi-private (11,647 beds), and 47 federal (12,184 beds).

In the brief description of the institutions the capacity, rates, date of opening, the names of the superintendent and medical director and transportation means of reaching the sanatorium are stated.

To make the directory complete the date of opening of several institutions now building is indicated. A. B. T.

The Diabetic Life: Its Control by Diet and Insulin. A Concise Practical Manual for Practitioners and Patients—*By R. D. Lawrence, M.A., M.D., Chemical Pathologist and Lecturer in Chemical Pathology, King's College Hospital. (2d ed.) Philadelphia: Blakiston,* 1926. 167 pp. 11 ills. Price, $2.50.

Since the discovery of insulin in 1921 by Banting and Best, knowledge of the use of that extract has rapidly increased. The clinical use of insulin has become general, and many lists of statistics and reports have added new facts referring to the management of diabetics.

It is the purpose of the author to include the last year's knowledge in this, the second edition of his brief and practical manual.

There is no disease in the category more individual, or more dependent on the personal attention of the doctor and patient, than diabetes. Therefore, the main facts relating to the disease should be the common knowledge of doctor, attendant, and patient. Any precise and simply written manual dealing with the etiology, symptoms, diagnosis, and treatment of diabetes is welcomed by all concerned.

In this book Dr. Lawrence has covered every angle of the diabetes question, using words and style so plain and direct that any layman might understand. In his discussion of dietary treatment the author gives the details of the line-ration scheme, and its advantages compared to the five-gram diet scheme. It is his opinion that the diabetic patient should be first required to use the line-ration scheme. After becoming adept as a dietitian, the patient then should adopt the five-gram scheme.

No stock diets are published, although a few recipes are given. Food tables for the five-gram scheme are complete, the values of certain articles being revised in this issue to conform to results of late analyses. Classification of foods according to carbohydrate, fat, and protein content in grams per 100 is not made.

The appendix discusses urine testing, forbidden foods, extras, etc. There are average weight tables, equivalent tables, detailed examples of a ten-line diet, and references to other books and articles. The volume is adequately indexed.

This little book will be of great value to all doctors and attendants of diabetes patients, and to those patients who have not already learned to select their diet from food lists classified to grams per hundred content of fat, protein, and carbohydrate. WALDEN E. MUNS

Medical and Eugenic Aspects of Birth Control—*Edited by Margaret Sanger. New York: The American Birth Control League,* 1926. 247 pp. Price, $2.00.

We have reviewed several books on the subject of birth control and pointed out the fact that the idea is unquestionably growing in practically all countries. This volume consists of papers presented at the Sixth International Birth Control Conference. While some of the objections to birth control are mentioned, the articles as a whole are strongly in favor of it and present the matter in its best light.

Perhaps the two articles best worth while are those by Havelock Ellis and William Allen Pusey, the latter discussing the responsibility of the medical profession in the movement. It cannot be said that any particularly new material has been added to the discussion.

On the whole the book lacks the balance of those heretofore reviewed, in which both sides of the question were discussed with great fairness. M. P. RAVENEL

Lesson Outlines for Maternity Classes—*East Harlem Nursing and Health Demonstration, New York City,* 1926. 95 pp. Price $.35.

This volume valuable to nurses and other health workers has been prepared by the nurses and nutritionists of this demonstration center located in one of New York's congested districts. The lessons are prepared for classes of expectant mothers, groups who bring their babies to the center for examination and instruction in their care, and for classes in child training.

Lesson plans or leaflets giving instruction for care during pregnancy, at the time of delivery and the postpartum period are simply and directly worded. The mother's daily program for her personal care is outlined. Nutrition is emphasized; menus are planned; and a few simple recipes are offered. Of course, mother's milk is emphasized as the best for the baby and a chart of nourishing and safe foods for the nursing mother with a sample menu for meals for one day supplements the instructions of the care of mother and baby.

The illustrations and reproductions of posters not only add to the attractiveness of the book, but they visualize the text, which oftentimes carries home the message more emphatically than the printed word. *Lesson Outlines for Maternity Classes* should be a part of the equipment of every public health nurse, social welfare worker and neighborhood visitor. A. B. T.

HEALTH DEPARTMENT REPORTS

IRA V. HISCOCK

New Bedford, Massachusetts—The 1925 Annual Report of the Board of Health of New Bedford is the forty-seventh which has been issued. This city of 135,132 people reported a crude death rate for the year of 10.3 per 1,000 population, with an infant mortality rate of 81. The leading causes of death were heart disease, broncho-pneumonia, cerebral hemorrhage, and cancer, in the order named.

At the beginning of the year, a new milk regulation became effective requiring that all milk distributed in the city be pasteurized, certified, or drawn from tuberculin tested cows. Following the advice of a special dental committee appointed to study the problem of dental hygiene, much of the reparative work has been replaced by what is considered preventive dentistry. The work is concentrated among the young children in the schools, and an effort has been made to reach preschool children as well.

Seattle, Washington—Bound in attractive dark blue cloth covers, the Health Department Report of Seattle contains interesting data for health officers. As the report contains 80 pages of text, tables and graphs, it is satisfactory to find a detailed index with topics alphabetically arranged. Based on an estimated population for the year 1925 of 335,000, a crude death rate of 10.05 is recorded. The infant mortality rate for the year was 44 per 1,000 births—a very commendable record. Seven infant welfare clinics have been conducted in which 1,133 new cases were admitted and 4,310 old cases continued. Home visits made by nurses of the division numbered 13,649. The regulating of child boarding homes is a function of the Child Welfare Division. These homes are inspected for requirements as to cubic space, ventilation, sanitation, and the character of the woman seeking a permit to board children is carefully investigated before the permit is granted.

The Firland Sanatorium, maintained by the city, cared for 327 tuberculous patients, giving 60,074 days of bed care. During the latter part of the year, a new up-to-date children's building accommodating 60 children was completed.

Montreal—The report of the Department of Health of Montreal for 1925 contains 168 pages of text and tabular material, printed in good type and bound in green paper covers. A well-arranged table of contents at the beginning of the report is useful. This is followed by two pages which indicate the organization and personnel of the department. It is interesting to find on the first page of the main report a statement of expenses for the Department of Health which indicate for the year 1925 an expenditure of 40 cents per capita for hygiene, and $1.25 per capita for municipal assistance. In this city of 669,800 people, there was recorded a crude death rate of 14.26 per 1,000, which is 3.96 per thousand below the average of the ten preceding years. An infant mortality rate of 122.4 for 1925 is the lowest observed in Montreal since the organization of the Bureau of Statistics. Montreal has the large birth rate of 32.8 per 1,000 people.

The Division of Child Hygiene was organized for medical school inspection and infant hygiene work. A total of 122,060 pupils was registered in the public schools, and of this number, 53 per cent were examined during the year. An interesting table indicates that of the 65,057 children examined, 21,976 had one defect, 6,420, two defects, 1,172, three defects, 115, four defects, and three, 5 defects, exclusive of dental defects. The proportion of defects having received treatment during the year reached 57.76 per cent on the average. Full-time medical inspectors, besides their regular school work, attend the baby clinics between 3 and 5 o'clock. These offices are at the same time vaccination posts at the disposal of the public throughout the year. Fourteen baby clinics have been maintained throughout the entire year, with 5 additional clinics during the summer months. Service in these clinics has been maintained by 12 nurses who carry on this work jointly with their service in the schools, receiving the assistance of 5 additional nurses who are employed entirely in the clinic work. Active supervision is exercised over children's boarding houses.

Hamilton, Ontario—The department of health of Hamilton reports progress in public health work in this city of 122,495 people during the year ending October 31, 1925. A well-arranged title page, bearing the city seal, is followed by two pages showing the personnel of the board and of the various departmental divisions. In his report to the mayor and the board members, the medical officer of health

notes a "healthy activity in those modern branches of public health endeavor which tend, not only to the lessening of morbidity and mortality rates, but which make for the enlightenment of the community at large, and of parents and those entrusted with the care of children in particular, in the essential facts of personal hygiene and their application to the daily lives of our citizens."

Among the new developments during the year should be mentioned the extension of laboratory work in pathology and public health, made possible at the Municipal Hospital where a new Outdoor Department has been constructed. The work of the Division of Dentistry has expanded with additional personnel. A new wing has been opened at the General Hospital, where the basement has been equipped for the sole use of a venereal disease clinic under the supervision of two physicians, with a social service nurse for follow-up work and recording.

The total number of births registered during the year was 3,143, of which number 126 were stillborn and 33 premature. It is noteworthy that all records with regard to the registration of stillbirths and the prematurely born are investigated by department nurses in order that they may be complete and accurate. A death rate of 10.29 per 1,000 population is recorded, exclusive of non-residents and still-births. The infant mortality rate in 1925 was 78.5 per 1,000 births.

Clinics for diphtheria immunization of children were opened in January, 1922, and up to the end of the year of this report, a total of 8,676 children had been treated. The detailed report concerning this work and its results is worthy of study by health officers engaged in diphtheria prevention. Another very interesting feature of the report is the clear and concise statement concerning the activities of the Board of Health nurses in school work, in child welfare, in home visits, and in the various clinics. The report as a whole, containing 96 pages, is well printed and carefully prepared.

New York State Division of Social Hygiene—The eighth annual report of the Division of Social Hygiene of the New York State Department of Health, coöperating with the United States Public Health Service, is of much interest. A study of the inside front blue cover shows one the distribution by sex, residence (urban and rural) and disease, of 17,776 new cases of venereal diseases up-state in 1925. A classified table of contents facilitates study of special topics in the report which deals with educational activities, coöperation with physicians and other state departments, clinic activities, statistics, and distribution of drugs.

The report calls attention to the fallacy of the grouping of syphilis, gonorrhea and chancroid under a general name of "venereal diseases," a term which was originally applied in the belief that these manifestations were morphologically similar. Certain specific statements seem worthy of quotation:

"Although the statistical information regarding syphilis and gonorrhea which has been collected during the past six years is recognized as far from complete, nevertheless it is sufficient to warrant the following statements:

"'That syphilis and gonorrhea combined are more prevalent than any other communicable disease with the possible exception of measles;

"'That syphilis and gonorrhea are diseases of youth;

"'That there is no apparent decrease in new infections of these diseases;

"'That the interest of physicians in seeking and treating syphilis and gonorrhea is increasing constantly;

"'That the public is beginning to appreciate that the control of syphilis and gonorrhea is one of the most urgent public health problems.'"

The Milk Inspection Association of the Oranges—Attainment of real progress in milk control is shown in the recent report of the Milk Inspection Association of the Oranges (New Jersey) for the years 1924 and 1925. That this organization is stimulating good milk production for the combined population of the five Oranges, numbering 140,000 is at once apparent, but an achievement of far greater import has been reached in that a community interest and a heightened standard of both supply and demand has apparently been reached. So well has public opinion been educated that the dealers take pride in having their milk not merely equal but excel the legal standard, while the people have raised their consumption of grade A pasteurized from 8.33 per cent of the total in 1915 to 67.03 per cent in 1925. Grades A and B pasteurized now make up 94.64 per cent of all the milk consumed, only 3.57 per cent being grade A raw, and 1.79 per cent certified milk.

A real achievement of the association is the fact that during the past six years there has been absolutely no milk-borne epidemic of a

communicable disease in the entire community. Another contribution made by the association to the progress of milk control is the publishing of the results of its trial experiments in 1924 wherein the "continuous-flow" pasteurizing machines were shown to be a failure and had to be reconstructed into "positive-holders," or replaced by such.

The Milk Inspection Association of the Oranges conducted its entire program of field inspection, laboratory control, and circulating publication of monthly reports of the chemical and bacterial contents of each dealer's milk at a total cost of 4 cents per capita for 1925.

The 1924–25 report is well written and clearly organized. Its charts and tables furnish comparative figures, not only for the two years just past, but for the period 1915–1925 as well, so that a perspective view of progress may be available. Numerous statistics are given with population, appropriations, consumption of different grades of milk, efficiency of pasteurizers, full analysis of each dealer's milk, and lists of applications refused and accepted.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

ARNOLD, L. Prophylactic and Therapeutic Possibilities of the Twort-D'Herelle's Bacteriophage. *J. Lab. & Clin. Med.*, 12:1 (Oct.), 1926.

Interesting experiments indicating that bacteria lysed by the phage are antigenic and confer active immunity. Bacteriophage prevents death when injected into a rabbit after a lethal dose of bacteria is given. The technic described will be of particular interest to bacteriologists working with the phage.

CHAPÍN, H. W. The Production and Handling of Human Milk. *Jour. A. M. A.*, 87:17 (Oct. 23), 1926.

The method by which one station obtained a reasonably steady supply of human milk for pasteurization and distribution to infants needing this food is described.

DESLOGES, A. H. Venereal Disease Control in the Province of Quebec. *Hosp. Soc. Ser.*, 14:4 (Oct.), 1926.

A report of the status of the venereal diseases in Quebec for the year 1925, together with a statement of the provincial anti-venereal program. Of particular interest are rules for the marriage of syphilitic persons.

EMERSON, C. P. Mental Hygiene: Wise and Unwise Investments. *Proceednigs of the General Sessions* (American Health Congress), Vol. 1, 1926.

A timely warning of what mental hygiene will not do; also an outline of the field of mental hygiene. A valuable paper, with which all health officials should be familiar.

HAMILTON, ALICE. The Health Committee of the League of Nations. *Proceedings of the General Sessions* (American Health Congress), Vol. 1, 1926.

Description of the activities of the Health Organization of the League of Nations.

FRANKEL, L. K. A Plea for a National Health Association. *Proceedings of the General Sessions* (American Health Congress), Vol. 1, 1926.

Sanitarians are asked to consider the advisability of forming a single non-official national health agency, either as a new organization, a combination of the existing agencies, or by enlarging the scope of one of them.

GLOVER, T. J. Progress in Cancer Research. *Canad. Lancet & Prac.*, 67:5 (Nov.), 1926.

The author reports the isolation of a pleomorphic organism from various types of cancer which can be grown in pure culture in its several phases. He produced a serum from it which has given remarkable results in a series of 50 reported cases. This is very important, if true. We suppose the Cancer Society will give an opinion later on the reliability of the findings.

GOLDBERG, J. A. Labor Enters Ranks to Facilitate Health Program. *Nation's Health*, 8:10 (Oct. 15), 1926.

Physical examinations of all members of labor unions, probably best accomplished by the coöperation of organized labor with established hospitals, is advocated in this article.

HARAP, HENRY. Disease Data Determine Emphasis in Health Course. *Nation's Health*, 8:10 (Oct. 15), 1926.

This study of the physical defects, the specific diseases, and the environmental factors that affect the health of women and girls in Cleveland was used as a basis in constructing a course of study in health for the girls of that city.

HASTINGS, C. J. Outline of Public Health Administration in Toronto. *Med. J. & Rec.*, 124:8 (Oct. 20), 1926.

Believers in the importance of health education will be delighted with Dr. Hastings's able presentation of the subject to the London Institute of Hygiene.

HESS, J. H., *et al.* Peptic Digestion of Cow's Milk. *Jour. A. M. A.*, 87:17 (Oct. 23), 1926.

Experiments *in vitro* and with puppies indicate the superiority of cultured lactic acid milk to other acidified milks. However, orange juice (2 oz. to qt.) is suggested because it gives highest total soluble protein and adds vitamins, mineral constituents, and alkaline buffer salts. The addition of raw egg yolk is suggested to add vitamin and iron.

HOLMQUIST, C. A. Experience in New York State on Resolution to Discontinue Cross Connections. *J. Am. W. W. Assn.*, 16:3 (Sept.), 1926.

A review of the efforts to enforce the regulation of the State Sanitary Code prohibiting certain types of cross connections. The author anticipates the early elimination of dangerous connections.

HORDER, THOMAS. On the Aims and Methods of Health Education. *Lancet*, 2:16 (Oct. 16), 1926.

The propriety and necessity for the entrance of the practicing physician in the field of popular health instruction are given a searching consideration. A committee to pass upon medical and health contributions to the lay press is suggested as a solution for the difficulties encountered in promulgating rational health information. A delightful paper!

HOYNE, A. L., and GASUL, B. M. Measles Prophylaxis. *Jour. A. M. A.*, 87:15 (Oct. 9), 1926.

Tunnicliff's anti-measles goat serum is found to have prophylactic value comparable to convalescent (human) serum. If administered not later than the fifth day of exposure, 90 per cent protection seems assured, the immunity lasting from 2 to 4 weeks.

KIRKCALDY, M. D. Visiting Nurse Association Supervises Student Nurses. *Nation's Health*, 8:10 (Oct. 15), 1926.

Visiting nursing under close supervision should prove a valuable addition to the student's hospital training. The author offers definite suggestions as to how this work should be carried on.

KNOWLTON, M. K. Septic Sore Throat in Connecticut. *Health Bulletin* (Connecticut), 40:10 (Oct.), 1926.

This describes the outbreaks of septic sore throat in Guilford and Hamden (the first from a tuberculin tested raw milk supply, and the second from a certified dairy). In both instances the supply was infected by a handler.

KRESS, C. C. The Navy's Work in American Samoa. *U. S. Nav. M. Bull.*, 24:4 (Oct.), 1926.

An interesting account of health work in Samoa where there are but two serious diseases, filariasis and tuberculosis, but where instruction in hygiene is badly needed. An infant death rate of 200 indicates the need for child hygiene work. The contrast between health work here and in that island is stimulating.

MACKENZIE, R. D. The Rous Sarcoma No. 1. *Lancet*, 2:15 (Oct. 9), 1926.

The author reports observations which tend to confirm Gye's findings of a virus and a "specific factor" as the causative agents of cancer. This partial corroboration is worth recording in the light of several failures to confirm Gye's findings.

MARINE, D. Simple Goiter and Its Prevention. *Jour. A. M. A.*, 87:18 (Oct. 30), 1926.

This is a clear and concise statement of the use of iodine in the prevention of simple goiter. We recommend that all health officials read this excellent presentation of a subject about which there is so much controversy.

MCINTOSH, J. Prophylactic and Therapeutic Immunization and Its Interpretation. *Lancet*, 2:18 (Oct. 30), 1926.

The trend of practice in both prophylactic and therapeutic immunization is toward simplification and avoidance of living viruses. Therapeutic immunization has both specific and non-specific factors, the latter is mainly dependent upon a general stimulation of tissues and leucocytes.

MELLON, R. R. The Infectivity and Virulence of a Filtrable Phase in the Life History of *B. Fusiformis* and Related Organisms. *J. Bact.*, 12:4 (Oct.), 1926.

Those who studied bacteriology when a bacillus could be depended upon to remain a rod will be interested in this report which suggests that common non-pathogenic organisms have a virulent, filtrable phase. The paper challenges our conception of viruses and secondary infections.

MCCOLLUM, E. V., *et al.* Studies on Experimental Rickets. XXVII. Variation of Vitamin D Content of Butter Fat as a Factor in the Development of Rickets Induced by Diets Suitable for Preparnig Rats for the Line Test. *J. Biol. Chem.*, 70:2 (Oct.), 1926.

A brief note reporting the finding of wide differences in the vitamin D content of butter fat.

MITCHELL, H. S., and SCHMIDT, L. The Relation of Iron from Various Sources to Nutritional Anemia. *J. Biol. Chem.*, 70:2 (Oct.), 1926.

A record of studies indicating the need of differentiating between soluble vs. insoluble rather than organic vs. inorganic iron in food stuffs or other sources.

MOSS, F. J. Experimental Studies of Water Purification. I. Description of Experimental Water Purification Plant. *Pub. Health Rep.*, 41:40 (Oct. 1), 1926.

The experimental plant at Cincinnati is so constructed that varying amounts of river water and sewage may be mixed to produce any degree of contamination.

NEWSHOLME, A. Private Medical Practice and Preventive Medicine. *Lancet*, 2:18 (Oct. 30), 1926.

The importance of the family physician to the tuberculosis, venereal disease, and child hygiene programs of local health boards is ably analyzed and presented.

NEWSHOLME, A. Values in Public Health. *Proceedings of the General Sessions* (American Health Congress), Vol. 1, 1926.

Sir Arthur presents a consideration of several objectives of health administration. Health officials who write will find this paper a veritable gold mine of sources for quotations. The temptation to quote from it, even in this statement, was very great.

OPIE, E. L., and MCPHEDRAN, E. M. The Contagion of Tuberculosis. *Am. Rev. Tuberc.*, 14:4 (Oct.), 1926.

An elaborate study of tuberculosis indicating that the disease exhibits the characteristics of a contagious disease, and that duration of exposure influences the severity of the infection. The importance of adequate diagnostic facilities is stressed.

PATTERSON, R. S. A Study of the Laboratory Aids to the Diagnosis of Chronic Gonorrhea in Women. *J. Immunol.*, 12:4 (Oct.), 1926.

A report of an inconclusive attempt to perfect a diagnostic test of greater value than the blood complement-fixation test for chronic gonorrhea. The latter test was found the most satisfactory.

PATTISON, H. A. Potts Memorial Hospital Assists Post-Sanatorium Cases. *Nation's Health*, 8:10 (Oct. 15), 1926.

An effort to bridge the transition from the routine of the tuberculosis sanatorium to home life. Work (on a 100-acre farm) suited to the strength and capabilities of the patient is provided, for which he receives a definite wage.

ROSS, V. Response of Orally Immunized Rats to a Second Injection of Pneumococcus and the Minimum Duration of Immunity. *J. Immunol.*, 12:4 (Oct.), 1926.

Feeding pneumococcic rat tissue is found to produce immunity to the disease (type I) lasting about 4 months.

SAND, R. Development of International Collaboration on Public Health Activities. *Proceedings of the General Sessions* (American Health Congress), Vol. 1, 1926.

A review is given of health work throughout the world in which the Red Cross is interested.

SIMON, C. E. The Filtrable Viruses and Their Nature. *Scient. Monthly* (Nov.), 1926.

A clear and comprehensive summary of recent advances in the knowledge of filtrable viruses. Excellent source material for the sanitarian who is preparing himself for educational work.

STREETER, H. W. Experimental Studies of Water Purification. II. Preliminary Review of Results of Primary Experiments. *Pub. Health Rep.*, 41:40 (Oct. 1), 1926.

Observations obtained at the experimental plant are found to agree with full scale municipal plant.

SWEANY, H. C. Mutation Forms of the Tubercle Bacillus. *Jour. A. M. A.*, 87:15 (Oct. 9), 1926.

The author suggests that mutation forms which appear on unfavorable media may be the cause of certain chronic diseases, although most of the mutation forms appear to be non-pathogenic.

SYDENSTRICKER, E. The Reporting of Notifiable Diseases in a Typical Small City. *Pub. Health Rep.*, 41:41 (Oct. 8), 1926.

The Hagerstown morbidity studies indicate that practicing physicians see 90 per cent of the serious notifiable diseases, but less than 65 per cent of the other diseases—measles, whooping cough, chickenpox. Of the cases seen, about 87 per cent of the cases of diphtheria, scarlet fever, and influenza are reported, 60 per cent of pneumonia, and 30 to 40 per cent of measles, whooping cough, and chickenpox.

TINKER, M. B., and SUTTON, H. B. Inefficiency of Most of the Commonly Used Skin Antiseptics. *Jour. A. M. A.*, 87:17 (Oct. 23), 1926.

Suggesting the superiority of analine dyes as skin antiseptics; acriflavin 5 per cent in 50 per cent alcohol is found effective. In the discussion, Young offers mercurochrome in acetone-alcohol solution as the one of choice.

VINCENT, G. E. International Organization for World Health. *Proceedings of the General Sessions* (American Health Congress), Vol. 1, 1926.

The importance of knowing what other countries are doing is set forth in Dr. Vincent's inimitable style.

WINSLOW, C.-E. A. The Health Officer and the State. *Proceedings of the General Sessions* (American Health Congress), Vol. 1, 1926.

Professor Winslow's story of John Smith's day might well be used to introduce and enliven otherwise deadly annual reports, or other papers for that matter. Legislation, finances, and leadership are also considered in the paper.

WITHERS, S., *et al.* Shortening the Quarantine Period for Diphtheria Convalescents and Carriers. *Jour. A. M. A.*, 87:16 (Oct. 16), 1926.

This is a report of the roentgen-ray treatment of diphtheria convalescents and carriers in which negative cultures were obtained 9 or 10 days after the beginning of treatment—another answer to the stubborn question, what to do with the persistently positive diphtheria convalescent or carrier.

WETMORE, W. O. A Device for Economically Oiling Ponds and Other Waterways. *Jour. A. M. A.*, 87:16 (Oct. 16), 1926.

The device is a conical weighted can with a wick outlet for the oil and a side intake for water. Thrown into a pond the water enters, forcing out the oil. A five-gallon can will oil a pond the size of a city block if the can is filled once a month.

YODER, L. The Relation Between Peroxidation and Antirachitic Vitamin. *J. Biol. Chem.*, 70:2 (Oct.), 1926.

Experimental studies are covered indicating a correlation between antirachitic potency and peroxidation of vegetable oils, cod liver oil, and cholesterol.

YOUNG, H. H. The Sterilization of Local and General Infections. *Jour. A. M. A.*, 87:17 (Oct. 23), 1926.

Biliary typhoid carriers are included among the other local infections, which may be expected to be benefited by intravenous injections of mercurochrome. Health officials who are at their wits end in the disposition of such carriers may be interested in Dr. Young's suggestion.

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D.P.H.*

A SECTION FOR HEALTH OFFICERS

WITH THIS ISSUE there is reëstablished in the JOURNAL a section which is devoted to public health administration, and to the interests of the health officer. Previous effort has been made to incorporate such material in the Editorial Section of the JOURNAL, but such columns have not been well supported by the health officers themselves. It is hoped that this section can serve as a continuous open forum for the inquisitive and searching health administrator, and as an outlet for those who have put into practice any revised or improved methods of procedure which should be broadcast to other members of our profession.

The Associate Editor in charge of this Section entreats and implores his fellow friends and health officers to correspond fluently with him at his Detroit address in order that we may all improve ourselves, and give each other the full advantage of the newer developments in our profession.

It is now a well recognized principle of the American Public Health Association that we are banded together as a group of professional sanitarians eager to fulfil our individual responsibilities which can be executed with maximum efficiency only when we are able to benefit from the experience of others.

We desire to have a full account of any administrative feature which may come to your attention, or which you may develop in your own department. This Section is not to contain personal notes such as might be found in a news letter, but rather it is the intention to discuss and describe methods and results, and to give some account of what it has cost to obtain these results.

The *Appraisal Form* developed by the Committee on Administrative Practice is serving a very useful purpose. For the first time we are able to compare our experiences, our results, and our organizations in terms of mutual comprehension and understanding. Many health officers have appraised their own communities, some have published annual reports basing their outline upon the *Appraisal Form*, and others are using it to stimulate an increase of appropriation for public health work. The Associate Editor would like very much to express in these columns some of the experiences of those who are using the *Appraisal Form*.

It is hoped that the readers of the JOURNAL will be liberal with their assistance in our endeavor to make this Section of the JOURNAL a success. You are invited to send your bulletins and special reports to the Associate Editor, and more especially you are urged to suggest topics which may be brought forth for discussion. Many of these subjects have appeared on the program at the Annual Meetings and have been threshed out at the open forums, but still there is much to be said and more to be learned. In some of our administrative procedures we can learn only by experience.

Record-keeping is an elaborate and expensive function in some health departments. There is little uniformity of practice. A sub-committee of the Committee on Administrative Practice is preparing a very admirable report on this subject, but it is hoped that you will take the time to write down your experiences and ideas in order that they may be published, and in so doing it is well to call attention to the cost involved in the execution of these clerical services.

In conclusion, let it be stated that if this Section is to prove of any real service it must have the unqualified support of those who are actually engaged in administrative work. The Editor hopes that you will be charitable and sympathetic, when he besieges you with questionnaires and inquiries. H. F. V.

Immunization for Diphtheria—There is every indication that diphtheria will not only be unusually prevalent in many American communities during the coming winter, but that

*Address all communications relating to this Section to the Associate Editor at Department of Health, 1300 Beaubien Street, Detroit, Mich.

the disease will be virulent and accompanied by a high mortality rate. Health administrators throughout the country are actively stimulating public interest in an immunization program. One of the outstanding programs is that being instituted in Syracuse where special clinics were opened November 15, in the parochial schools.

In the Bellevue-Yorkville District, New York City, there has been admirable coöperation between the various official and non-official agencies, and the life insurance agents have visited the homes in the area urging the immunization of the preschool child.

In Detroit there is at present an abnormal amount of diphtheria approaching an epidemic situation. The health department has carried on a very active educational program with the coöperation of the press and other agencies. Through the courtesy of the agents of the Metropolitan Life Insurance Company and the John Hancock Mutual Life Insurance Company, virtually every home in the Detroit area, with a population of 1,500,000 has been canvassed. So far as area and population are concerned, this is one of the largest undertakings of this character of which we have knowledge. During the first 4 weeks following the inauguration of the drive and the opening of 22 additional clinics, which have been open 7 days of the week, there have been given approximately 85,000 first doses of toxin-antitoxin. Most of those treated are children under 10 years of age. The medical profession is strongly supporting the campaign and approximately one-half of the treatments have been given by the family physician.

The insurance agent in visiting the home, in addition to personally encouraging and soliciting the support of the parent, has left a leaflet on diphtheria prevention prepared by his own company, and one prepared by the Health Department. He is also fortified with a reference slip in duplicate, the original of which serves as an admission ticket to the clinic, and is a consent slip from the parent. Such a system should be effective in any community where the good will and support of the insurance agent can be obtained.

Smallpox in Milwaukee in 1925—The Milwaukee Health Department has recently issued a report on the outbreak of virulent smallpox which occurred in 1925, there being 386 cases and 87 deaths. Milwaukee had not experienced the virulent type of smallpox since the epidemic of 1894–95.

The outbreak started in December, 1924, the infection being imported by one man who had visited in another city where the virulent type of smallpox was present. The greatest number of cases was reported during the month of May and the first half of June. The community was apparently not aroused to the necessity of vaccination until May, when during a single month 222,500 people were vaccinated, giving a total of approximately 400,000 vaccinations during the outbreak.

There occurred 271 cases of discrete smallpox of which 19 died; 93 confluent cases of which 46 died; and 22 cases of hemorrhagic smallpox all of which died. This is quite in keeping with the experience in other cities recently visited by hemorrhagic smallpox, where virtually all cases of virulent type have resulted in death.

The vaccination history of 386 cases shows that 327 had never been vaccinated; 46 had been vaccinated sucessfully more than 10 years ago; 11 had been successfully vaccinated more than 5 years ago and within 10 years; 2 gave uncertain histories of vaccination, and there were no cases among those who gave a history of successful vaccination within 5 years.

Modern control methods were used during the outbreak, rigid quarantine was enforced, the majority of cases were hospitalized, contacts were followed up and vaccinated and observed during the incubation period, general vaccination was employed in industrial plants, and through a special emergency ruling of the State Board of Health certain city blocks were placed under quarantine. This was done in areas where there developed within a period of 14 days cases of smallpox in 3 or more homes in a given square block. Persons were permitted to enter and leave the infected area providing they had been successfully vaccinated.

LABORATORY

C. C. YOUNG

ANTIPNEUMOCOCCIC SERUMS; PURIFICATION AND CONCENTRATION

FRANK M. HUNTOON, M.D., FELLOW, A.P.H.A.
The Mulford Laboratories, Glenolden, Pa.

THE NUMBER of immune bodies in antipneumococcic serum is relatively low in comparison to the antitoxic serums, necessitating the employment of comparatively large doses (50 c.c. to 100 c.c.).

The introduction into the circulation of such amounts of foreign protein is followed in many instances by reactions, and by the annoying serum sickness. The bulk of the dose causes many physicians to hesitate both as to the original administration and to the follow-up dosage, this in a disease where the essentials of efficient specific treatment consist in the introduction of a large amount of immune substance as early in the disease as possible.

These considerations emphasize the desirability and even necessity for the production of immune body bearing solutions, not having the undesirable features of the raw serum, which will enable the early administration of the immune bodies in sufficient amount to produce the therapeutic effect desired.

The attempts to produce such solutions extend over a period of more than ten years and may be divided into two classes: Nonspecific—utilization of physico-chemical means, modifications of the usual methods for the concentration of diphtheria antitoxin; and specific—the utilization of the combining power of the immune bodies or antibodies with its homologous antigen.

NONSPECIFIC METHODS

In 1915, Avery[1] investigated the fractionation of Type I antipneumococcic serum by means of varying concentrations of ammonium sulphate, employing the usual technic used in the production of diphtheria antitoxin.

He found that many of the antibodies present were precipitated with the euglobulin fraction and that complete precipitation occurred with 38 per cent saturation.

Some years later the author repeated this work and found that with 33 per cent saturation, the point usually employed to remove euglobulin, that approximately half of the protective antibody was removed. If the preliminary precipitation took place at a point allowing most of the antibody to remain, the subsequent solutions produced by the dissolving of the 40 per cent secondary precipitate, contained a considerable amount of euglobulin which eventually caused these solutions to precipitate and rendered them unfit for therapeutic purposes.

Also the author with Reichel[2] in 1920 investigated the fractionation and concentration of such immune serums by means of dilution with water and passage of CO_2 through the mixture, the resultant precipitate contained 50 per cent of the immune body. The filtrate of such precipitates on saturation with sodium chloride precipitated again to bring down 50 per cent of the remaining antibody. By mixing the precipitates and dialyzing, concentrations of three or four times could be secured. But again after six months in the icebox such solutions precipitated and the method was abandoned as impractical.

In 1924 Felton[3] published the work he had done in antipneumococcic serum, and this has been followed by other papers.[4, 5] Briefly, Felton found that when a fresh, unpreserved Type I serum is diluted 10 to 20 times with distilled water a fine white precipitate develops which on standing in the icebox settles out; this precipitation is aided by the addition of weak organic acids up to a certain hydrogen ion concentration.

Such precipitates carry with them most of the antibody content, which may be recovered by dissolving the precipitate in from 1 to 3 per cent sodium chloride. Such solutions afford concentrations of 3 to 10 times, but the actual

concentration is not of as much importance as the reduction of protein content per unit of antibody.

Felton has adopted as a convenient unit of measurement the amount of solution that protects mice against 1 million fatal doses of Type I pneumococci, and has routinely determined the nitrogen content of his concentrates. He showed that employing a mixed concentrate from a number of serums that the nitrogen content per protective unit had been reduced 10 times from the original serum. Such determinations vary considerably, but the lowest figure given by Felton for such a protective dose is 0.0079 mg., nitrogen equal to 0.049 mg. of protein, occurring in one of his concentrates. The lowest figure for untreated serum is 0.022 mg. nitrogen or 0.1375 protein.

Such solutions are having an extensive clinical trial, the results of which have not yet been published. Felton moreover is employing these solutions to investigate the nature of the immune substance without as yet having come to any definite conclusion.

This method of concentration is relatively simple and inexpensive, but the fact that fresh serum must be employed and that highly potent serums are also advisable are drawbacks.

Banshaff[6] has published a method of preliminary treatment with sodium sulphate which eliminates the first of these objections at the cost of a complication of the technic.

SPECIFIC METHODS

Gay and Chickering[7] in 1915 added a solution of dissolved pneumococci to antipneumococcic serums, causing a precipitin reaction, collected the resultant precipitate, washed it, and dissolved the residue in alkaline salt solution. They found that such solutions contained much of the antibody from the serum and a considerable amount of serum-globulin; these solutions were tried on a few cases. The method was abandoned shortly, apparently on account of technical difficulties.

In 1919, the author[8, 9] began an investigation of the possibility of recovering antibody from sensitized pneumococcus organisms, that is pneumococci that had been allowed to absorb antibody from immune serum.

This work has continued to the present time and has resulted in the production of so-called antibody solutions that are free from the objections inherent in the use of raw horse serum.

The basis of the procedure is simple, pneumococci of the three fixed types are emulsified in a serum polyvalent to the three types. After a suitable period the bacteria are removed by centrifugation carrying the attached antibody.

These sensitized organisms are washed with cold salt solution several times and emulsified in an alkaline salt solution in which a separation of the antibody from the bacteria takes place.

Originally this alkalinity was produced by the addition of 0.25 per cent sodium bicarbonate and the emulsion was heated to 55° C. for 30 minutes. The emulsion was again centrifuged, the supernatant cooled and passed through a filter candle to remove organisms remaining in suspension and to insure sterility. Solutions were produced in this manner on a large scale and an extensive clinical trial was made under controlled conditions, with favorable results (Cecil and Larsen[10] and Conner[11]).

On intravenous injection of these solutions a reaction was produced, chill with abrupt rise of temperature. Not only was such a reaction disagreeable and occasionally dangerous, but it complicated the question of the cause of the favorable results obtained.

Since both in the human and in monkeys suffering from lobar pneumonia the blood stream infection could be controlled, it seemed probable that antibody action was the essential feature. Moreover cases of streptococcus pneumonia were unaffected by the administration of pneumococcus antibody solutions although such cases invariably showed the shock reaction.

In order to minimize the shock a series of cases of pneumococcus lobar pneumonias were treated by subcutaneous injections of the antibody solutions. Owing to the failure of the antibody to appear promptly in the circulation after such injection, the results were poor and this method was abandoned.

In the meantime, the causation of the shock reaction had been investigated and a new technic devised for the preparation of the antibody solutions, consisting essentially in performing the whole process at icebox temperature and the use of weak solutions of sodium hydroxide to produce the alkalinity desired. Antibody solutions have been so prepared for the past year with the result that the reactions have been much reduced.

An occasional case will still have a mild reaction, but the majority do not, and this has enabled the determination of the fact that antibody action alone will have a markedly beneficial effect on pneumonia cases, particularly when given early.

The clinical experiment with these new solutions is still under way and the results will be reported at a later time, as to the statistical data, but clinical observation on individual cases by those engaged in the experiment is sufficient to indicate that when used properly early in the disease this method of administration of antibody substance produces therapeutic results without any of the deleterious effects accompanying the employment of raw horse serum.

A further development of this method is the concentration of such solutions. By rather simple means concentrations have been obtained of 50 to 100 times with a further purification. A test of one such concentrated solution showed that the total organic solid content per protective unit (as determined by Felton) was 0.00525 mg., about one-ninth of the lowest figure given by Felton for protein.

Moreover, a determination of weight lost by the absorption of such solutions with the homologous organisms, gave a figure of 0.00022 mg. per protective unit.

Although in comparison with the total solid content of the average immune pneumococcus serum the total organic solid content of these solutions is as 5 is to 1000, it is probable that the true ratio of the pure antibody substance is less than 0.2 to 1000 so that considerable latitude is still left for the production of pure antibody solutions.

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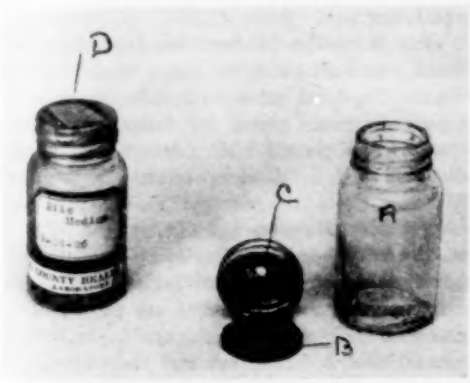
PREPARING BILE MEDIUM TO FACILITATE THE TAKING AND MAILING OF TYPHOID BLOOD CULTURES

R. V. STONE

Director of Laboratories, Los Angeles, Calif.

PROCURABLE at any laboratory supply house is a wide-mouth bottle (A) equipped with a cork-lined aluminum screw cap. The cork lining is replaced by rubber insert (B) made from a good grade of gum rubber. A hole 3/16 inch in diameter (C) is drilled through the center of the cap with the lining removed. Eight cubic centimeters of bile medium are placed in a one-ounce bottle, the cap screwed on tightly and the assembled outfit sterilized fractionally or under pressure. After sterilization a drop of iodine is placed on the hole in the cap and covered with a small piece of adhesive surgical tape (D). The iodine serves to prepare the rubber surface of the cap liner by keeping it sterile, pending the time for inoculation, and the adhesive effectively seals the hole in the metal cap, excluding dust.



Outfit for storage and transportation of medium in typhoid diagnosis. The outfit is simple and inexpensive and should be valuable in public health laboratories, for it eliminates leakage during transportation and minimizes the possibility of contamination during collection of specimen.

Finally, melted paraffin is brushed on at the juncture of the cap with the glass to prevent evaporation and discourage unscrewing the cap when inoculating the medium.

PROCEDURE

To use this container, blood is drawn from the vein with a sterilized syringe. The adhesive

plaster seal is stripped from the hole in the bottle cap, the hypodermic needle shoved through the rubber liner and the contents of the syringe ejected into the bottle. The bottle is shaken to mix thoroughly with the bile medium and is then ready for mailing or bringing into the laboratory.

Utilization of this outfit has resulted in the elimination of the accidental contaminations which are apt to occur while withdrawing corks or cotton plugs from tubes or flasks under field conditions. It also provides a leak-proof container that can be mailed.

We have utilized this container in a variety of ways. It is just as satisfactory for dextrose broth in streptococcic septicemia as for bile medium in typhoid diagnosis. It can also be used for transporting carbohydrate media when using the familiar type of homeopathic vial of flint glass. This is a bottle having a nickel cap which screws directly onto the glass. The 4-dram bottle, 58 mm. high and 17 mm. in diameter is most convenient. The bottle can be provided with the inverted tube for gas production observation after the Durham tube. For use in this way it is unnecessary to have a hole in the cap, although the rubber liner is necessary to provide for a non-leaking seal.

VITAL STATISTICS

LOUIS I. DUBLIN, PH.D.

Tuberculosis Mortality in Fourteen Countries—The data obtained in making this study fell naturally into three divisions, relation between the decline in the general death rate and the tuberculosis death rate; comparison of the decline in the mortality from pulmonary tuberculosis and that for other forms of tuberculosis and variations by age and sex.

In most countries a close correlation is shown between the decline in the general death rate and the tuberculosis death rate; this is particularly true in the case of Austria, Germany and the Netherlands. In England in earlier years this close correlation was very evident but since 1911 there has been a marked decline in tuberculosis mortality. This would indicate that definite anti-tuberculosis measures bring about a lowering of the tuberculosis rate. Since 1916 the United States Registration Area has recorded a decided decline in the tuberculosis death rate. The same is true in Scotland, New Zealand and Australia.

In general, the death rate from tuberculosis of other forms than pulmonary, has been declining during the last 25 years, but the correlation between the decline in the pulmonary and the non-pulmonary rates has not been nearly so close as that between the pulmonary and the general rate. In Ireland, New Zealand, Netherlands, U. S. Registration Area, Australia, and Switzerland, the mortality curves of non-pulmonary tuberculosis and pulmonary tuberculosis have declined in general at a similar rate. In England and Wales, the decline in other forms of tuberculosis than pulmonary has been somewhat greater than for the pulmonary type. From 1900 on, both in the U. S. Registration Area and Scotland, the trend of the rate of non-pulmonary tuberculosis was up grade. In 1905 the trend for the United States began to descend. This descent did not begin in Scotland until 1907. In Germany, the rate for other forms of tuberculosis is on the increase, the trend being decidedly upward since 1900. In Italy, records show a falling rate from other forms with the general trend of pulmonary tuberculosis on a level, neither increasing nor decreasing.

Only 9 of the 14 countries reporting gave death rates according to sex. In the United States, the death rates from tuberculosis have been consistently higher for males. The same condition is recorded for Australia, Austria, Belgium, and Scotland as well as England and Wales. Quite the reverse is true for the Netherlands, Sweden, and Switzerland. Japan also tends to show the same phenomenon, namely, higher tuberculosis rates in females, but complete enough figures are not available to include this country in the study. In Ireland since 1917 the female rate has risen above the male, where previously the death rates for both sexes had been about the same—*Tuberculosis Mortality in Fourteen Countries. A Preliminary Study.* Jessamine Whitney and Lloyd Wilcox. 38 pp. 1926.

Smallpox in American States and Canadian Provinces, First Six Months of 1926—Reports from 41 states and the District of Columbia and from 8 Canadian provinces show that smallpox during the first half of 1926 was less prevalent than in the same period of last year. In the United States it was also, by and large, of a less virulent type, the case-fatality rate dropping from 2.2 deaths per 100 cases during the first half of 1925, to 1.6 in 1926. In Canada, although the number of case reports declined from 916 to 739, the deaths increased from 10 to 13 and the case-fatality rate from 1.1 to 1.8. In the 42 American communities, the case-fatality rate was higher, however, than for the first half of 1924.

In Florida, from which the largest number of cases was reported, the disease, fortunately, was of a mild type and the mortality was low; and this also applies to Indiana and Oregon, and to other states where there were many cases of smallpox. In California, which ranked next to Florida in actual prevalence of the disease, smallpox prevailed in an extremely virulent form with the result that one person died among every 10 who were sick with the disease, the actual death toll being 231 lives.

In Arizona there were only 16 smallpox cases, but there were 6 deaths. If this degree of virulence had been general among the 20,561 cases of this loathsome disease reported from 42 American communities, during a 6-months' period, more than 7,700 lives would have been lost.—*Stat. Bull.* Met. Life Ins. Co., 7:7 (Sept.), 1926.

Children under Institutional Care, 1923—On February 1, 1923, there were 404,678 dependent, neglected and delinquent children in care of institutions and child placing agencies. In institutions and receiving homes, there were 204,888 children; in foster homes, 73,445; in their own homes, 121,441; while 4,904 were elsewhere, such as temporarily away from institutions or not reported.

The Middle Atlantic states had the greatest number of children (68,926) under institutional care and in child placing agencies. According to the ratio per 100,000 population, the highest rate of 353.0 is given for New England states and the lowest, 98.7 for the West South Central group.

There were 29,468 juvenile delinquents in penal institutions and special institutes receiving children on commitments. Of this number 25,233 children are between 10 and 17 years of age. The most striking changes between 1910 and 1923 are the great decline in the proportion of delinquents admitted to jails and work houses and the proportional increase in the number admitted to institutions primarily for the care of juvenile delinquents. Distribution according to age indicates considerable progress in keeping children of tender years out of penal institutions.

The percentage of illiteracy among juvenile delinquents admitted to special institutions for their care was much smaller in 1923 than in 1910, 3.5 as compared with 8.6.—*Prel. Bull.* Dept. of Commerce, Bureau of the Census, Washington, D. C. 12 pp. 1926.

A Medical Review of Soviet Russia—Modifications in disease have taken place all over the civilized world as a result of war, influenza pandemic and social changes but not on the same great scale as in the Union of Soviet Socialistic Republics (Russia). In no other country were conditions so bad and in no other country were the changes in morbidity so enormous. Some of these changes have been so remarkable and so little has been written about them in Russian and almost nothing in English, that the author who spent two and one-half years in Russia, carefully collected the following facts from articles written by Russian specialists during the famine, records of the American Relief Administration, inspection trips, observations and the statistics of the Soviet Department of Health.

Public organization which the Soviets inherited from the Tsarist régime was almost nil and there was thus a strong contrast between Russia and such countries as Germany and Finland which were also devastated by war, revolution, famine and disorder. Epidemics appeared in them at the same time as in Russia, but with their highly organized public health systems and the general education and cleanliness of the people, typhus was soon checked. The birth rate in Russia in 1924 was 41.1 per 1,000 population as compared with 44.7 in 1913. The death rates were 22.9 and 22.4 respectively. The death rate of 33.2 for 1920–1922 was, according to some Russian authorities, much higher; in many parts of Russia it reached 85 during the worst period.

The epidemics of typhus and relapsing fever which coincided with the famine were probably the largest ever seen in Russia. Thirty-five million cases of these diseases together in Russia followed the World War. In 1913,

there were 374,862 cases of typhoid fever. This figure rose to 424,000 in 1920 and then fell to 166,399 cases in 1924. The cholera epidemic in 1921 was exceeded only by that of 1892. In 1921 there were 205,000 cases of cholera in Russia, 159 cases in 1923, and 10 cases in 1924. The malaria epidemic which followed the famine was decidedly the largest of its kind on record. Epidemics of malaria, syphilis and tuberculosis remain problems of the present Russia. Smallpox was slightly increased during the first year of the famine but typhoid decreased. Since 1922 all of these infectious diseases have markedly decreased except malaria and children's infections which have increased. In 1924 there were 2,198 cases of epidemic encephalitis as against 958 cases in 1923.—W. Horsley Gantt, *Brit. M. J.*, 2:303–307 (Aug. 14), 1926.

Statistical Review of England and Wales, 1924—For the year 1924 the standardized death rate was 10.7, the lowest on record with the exception of 1923 when the death rate was 10.3. The influenzal mortality of March, 1924, is the chief cause of the present increase. The infant mortality was 75 per 1,000 births, an increase of 6 over the figure for 1923. The urban mortality exceeded that of rural districts by 25 per cent, the urban excess increasing with age and being due for the most part to bronchitis and pneumonia, diarrhoea and premature birth. The two former are among the preventable causes and are diseases of town life.

The general mortality at all ages under 75 for each sex is lower than it was before the war. The decrease is greater in the age group 0–5 years than at any later period. In 1924, the drop for each sex in this age group was about 40 per cent.

A study of causes of death reveals a lessened fatality in the chief infectious diseases. Enteric fever has been the same for 6 years with a mortality of 13 per million. Malaria is "wholly imported." Smallpox fatality is 3 per 1,000 cases. In London the measles mortality is more than twice that of England and Wales. Scarlet fever shows a mortality of 74 per million and a fatality rate of 10.5 per 1,000 cases. Incidentally this mortality is about 3 per cent of that recorded for 1861–1870. Diphtheria mortality is 23 per million. For 6 years in succession, the tuberculosis death rate is lower than any previous year. The same is true of syphilis which in 7 years has fallen 32 per cent. Cancer mortality shows an increase, that of carcinoma being more rapid than that of sarcoma. This rapid increase in the cancer situation is very evident in male mortality. Puerperal deaths show a rate of 3.7 per 1,000 births. This mortality has remained stationary during the last 14 years.

The birth rate recorded was 18.8 per 1,000 of the living population. From the more accurate point of view of fertility, the rural districts now lead as the more productive areas. The natural increase was 6.6 per 1,000 which is the lowest on record and, present tendencies continuing, may decline still further.—Registrar-General's Statistical Review, England and Wales, 1924. 155 pp., ab. *Med. Off.*, 36:192 (Sept. 4), 1926.

The Irish Free State Census of 1926—During the 15 years between April 2, 1911, and April 8, 1926, the Free State population decreased from 3,139,688 to 2,972,802, or 5.3 per cent. A decrease of 3.7 per cent is recorded for all Ireland during the same period of years, the 1911 population being 4,390,219 and that of 1926, 4,229,124. Meanwhile the population of Northern Ireland increased from 1,250,351 to 1,256,322, or 0.5 per cent.

In the Saorstat there are 973 females to every 1,000 males, whereas in Northern Ireland there are 1,066 females to every 1,000 males. In Ireland as a whole there are 999 women to every 1,000 men. Dublin has a female population exceeding its males, while in the country districts conditions are reversed.

Ireland is unique among countries in the world since 43 per cent of its native-born population resides in other countries. In the United States alone there are 1,037,234 such persons and 367,747 others live in England and Wales. This exiled population attracts a large number of friends and relatives every year in spite of the prosperous conditions now existing in Ireland.—*Brit. M. J.*, 2:402 (Aug. 28), 1926.

Vital Statistics of France—The statistics published by the minister of health and labor for the first three months of 1926 follow:

There were 73,840 marriages during the first three months of 1925 and 68,323 during the corresponding period of 1926. The divorces, which numbered 4,204 in 1926, were slightly under the figure for 1925 (4,367). The births show a decrease (195,467 in 1926 as against 199,815 in 1925). Infant mortality declined from 19,412 deaths in 1925 to 16,474 deaths in 1926. The total number of deaths for the first

3 months of 1925 was 204,391, while, during the corresponding period of 1926, the total was 186,376, so that the excess of births over deaths for the quarter was 9,091, whereas for the first 3 months of 1925 the excess of deaths over births was 4,576.—*Jour. A. M. A.*, 87:1049 (Sept. 25), 1926.

Infection and Malnutrition in Children—Quite contrary to general opinion held by the medical profession and the laity, high health has an inverse relation to high resistance for the person whose previous history shows continuous uninterrupted high health (in the absence of exposure to infection) is more than likely to be susceptible rather than resistant to infectious disease since the very absence of previous infection left him without any accumulation of those immunities acquired by sickness or exposures to infection. This principle is admitted in practice for, in the matter of quarantine when persons have been exposed to an infectious disease, inquiries are not made as to the present state of high health but whether the persons have had this particular disease before. Quarantine or release takes place on this basis and not on the basis of poor or good health at the time of exposure.

With this idea in mind, a height-weight-age survey was made of all public school children in Vancouver, B. C. The nutritional status of about 6,000 children, 4,000 normal weight and about 2,000 mal-nourished, was established. The result showed no appreciable difference between the mal-nourished and well-nourished as to the total percentage affected by infectious diseases.

The second test was to list children who had contracted various infections and then to look up in the school records their previous nutritional standing. The incidence of the 6 diseases dealt with was found not to be affected to an appreciable extent by the malnutrition or otherwise of the school children.

The incidence in different individual diseases varied much in the various tables and was not consistent for any one disease. The existence of variation in itself throws doubt upon the existence of a general resistance to infection, lowerable by a general cause such as malnutrition.—Non-relation of Malnutrition in school children to infection. H. W. Hill, *Canad. M. A. J.*, 16:1086–1092 (Sept.), 1926.

Life Expectancy in General Paralysis—The history of Middletown (N. Y.) State Homeopathic Hospital goes back 52 years. In early days, the duration of life for paretic patients after entering the hospital was only 9 months. The adoption of the "hospital idea" in the care of the insane, in the early eighties, benefited cases of general paralysis. The average duration of life rose promptly and for the period between 1885 and 1900, averaged slightly in excess of 23 months after admission. From 1907 to 1917, 111 paretics were admitted, who subsequently died in the hospital, with an average duration of 26 months after admission. Nursing care with little or no medical treatment, except a homeopathic prescription occasionally for intercurrent disorders produced this result. From 1917 to 1925, the average duration of 86 cases who died up to June 1, 1925, was 15.8 months, which average will be considerably extended when the longer lived cases not yet dead, come to be reckoned.

The nearest comparable figures are those published by the New York State Hospital Commission for all cases of general paralysis dying between July 1, 1921, and June 30, 1924. There were in this period 2,152 deaths whose average time in the hospital was 1.5 years.

Malarial treatment was first tried on 3 cases at Middletown in the summer of 1924. One case was paroled September, 1924, and has been at work since. Encouraged by this case, malaria has been used for all paretics. The death rate during 60 days after inoculation has been unusually high and only time can tell if the average duration of cases will be extended or how long the present series of remissions will continue.—The Normal Course and Expectation of Life in General Paralysis. Robt. Woodman, *State Hosp. Quarterly*, 11:644–650 (Aug.), 1926.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C.E.

Résumé of Trinity River Situation as Disclosed by Texas State Board of Health Investigation, 1924–1925—Continued complaints of the pollution of the Trinity River both by municipal sewage treatment plants and industrial waste discharges, prompted the Texas State Board of Health in the latter part of 1924 to undertake a thorough investigation of this large and important waterway.

The data gathered by the investigators included laboratory and field determinations of the stream conditions throughout a great portion of the river's length. The main stream, approximately 550 miles in length, drains a large and fertile part of the state, and serves an area which includes some 100 towns and cities. The varied uses to which the river water is subjected, namely, irrigation of truck farms, watering of farm animals and dairy herds, emergency water supplies for nearby cities, bathing, oyster beds at the mouth of the river, and the possible use for municipal purposes in the more densely populated industrial districts through which it flows made it necessary that the entrance of dangerous and objectionable polluting matter be eliminated.

For considerable distances below the sewer outfalls the physical condition of the river was most objectionable—odors, turbidity, color, scum formation, and at times the actual prevalence of septic conditions in the stream made it in places little more than a large flowing sewer. In these sections a total absence of fish life was noted. The chemical examinations as made at some 40 selected sampling stations along the stream included those for solids, oxygen consumed, alkalinity, dissolved oxygen, nitrogen, chlorides and stability. Physical and bacteriological examinations also were made.

Treated Water in Swimming Pools—The various complaints made by the public against the chlorine used for sterilizing water of swimming pools are discussed.—F. H. Stover, *J. Am. W. W. Assn.*, 14:440 (Nov.), 1925. Abstracted by H. B. Hommon.

Standing of Detroit Swimming Pools—A table shows average results of 502 bacterial examinations of the 28 pools operated in Detroit during the third quarter of 1925. Twenty-one pools, or 75 per cent, are rated as Grade A, complying with the Department of Health standard. Seventeen pools show a median bacterial count of less than 100 per c.c. Four pools show no colon in 100 c.c. and 13 others average less than 10 colon per 100 c.c.

Of the 7 Grade B pools not meeting the required standard, 6 are operated on recirculation, and one by fill and draw. Of 10 pools equipped with ultra violet disinfection apparatus, 6 are in the Grade A list and 4 are in the Grade B list. Two of the U.V.R. pools are listed as also using hypo disinfection and one as using liquid chlorine.

The report states, "While the averages for the three quarters of 1925 show comparatively little improvement one over another, any one of them indicates a vast improvement over the averages for the first 10 months of 1924."

"Reports indicate very clearly that equipment is not the sole requisite for clean swimming pool water and that adequate supervision and care are most important. Many pools with inadequate equipment have been able to maintain a high standing by intelligent care and interest on the part of those responsible for the pool coupled with the coöperation of the bathers themselves."—*Weekly Health Review*, Detroit Dept. of Health, Series 6, No. 44 (Oct. 31), 1925. Abstracted by S. DeM. Gage.

Troubles with a Swimming Pool Using a Recirculating System—The author lists four common water defects and gives possible sources as follows: (1) Water in the pool not clear and sparkling may be due to improper filtration, recirculation rate being too low, system not operating long enough, inlet and outlet piping not correctly designed. (2) Irritation of eyes or other membranes may be due to free alum (acid water) or to excessive chlorine disinfectant. (3) Algae in pool causing un-

pleasant odor or dirty tile can be remedied by copper sulphate treatment. (4) Clear, sparkling water not sanitary because of high bacteria content may be due to recirculation too small for bathing load, bathers failing to properly cleanse themselves before entering pool, water temperature too high, disinfectant insufficient in amount, or not applied properly.—Robert O. Friend, *J. Am. Assn. Promoting Hyg. & Pub. Baths*, 7:71, 1925. Abstracted by S. DeM. Gage.

The **Mineral Springs of Saratoga, N. Y., and Their Future Development**—The Cure at Saratoga Springs by Mineral Waters and Baths—The mineral spring area is largely included in state reservation, a part of which is leased to private development companies. Thirty-two springs are in constant use for drinking or bathing. Some of the springs are radio-active. Waters are classified as the saline-laxative or cathartic waters, containing magnesium bicarbonate and sodium sulfate; the alkaline waters, strongly alkaline with chlorides and bicarbonates of soda, barium, magnesium, calcium and iron; the chalybeate or iron waters containing ferrous bicarbonates; the highly carbonated table waters. All these are highly charged with CO_2. There is also a soft water without mineral content. The regimen and use of different drinking waters and baths in the treatment of various types of ailments are described in detail.—Geo. F. Peabody, A. S. Downs, and John F. Humphrey, *J. Am. Assn. Promoting Hyg. & Pub. Baths*, 7:31, 1925. Abstracted by S. DeM. Gage.

Recording the Hydrogen Ion Concentration of Potable Water—Some general considerations are given on the relation of hydrogen ion concentration to various chemicals used in water treatment, and an apparatus is described which produces a continuous record of hydrogen ion concentration, with but little expert care.

The problem has been that of finding suitable electrodes rather than of developing the measuring instrument. In the apparatus described, a tungsten electrode and calomel cell are used for values of pH ranging from 5.0 to 12.0. The total time required for operating this instrument is given as less than ten minutes per day. For values of pH ranging from 3.0 to 7.5 a quinhydrone electrode is used by the addition to the tungsten type of an adapter and the introduction of a gold electrode in place of the tungsten, which apparatus also requires but little attention. Views are shown of (1) A Recording Potentiometer, and (2) Mercury-Calomel Half Cell and Tungsten Electrode.

The interpretation of the readings is discussed, and illustrated by a chart for the tungsten electrode, showing curves for interpreting voltage in terms of pH. The more uniform chemical treatment obtained is illustrated by showing a reproduction of graphs of H-ion records from the Montebello filters at Baltimore.

The only trouble found in the method as used at Baltimore is that during part of the warmer months a coating of slime forms over the tungsten wire causing the voltage to drop, thus requiring more frequent changing of the tungsten electrode at such times.—John R. Baylis, *J. Am. W. W. Assn.*, 15:22 (Jan.), 1926. Abstracted by A. L. Dopmeyer.

Design and Equipment of Connecticut Swimming Pools—The State Sanitary Code now requires plans for new swimming pools to be approved by the State Department of Health. The author states that some of the features to be considered in the construction of a pool, aside from structural details are location, capacity, scum gutters, walks and drains, light, heating and ventilation, water supply, methods of purification and sediment removal and sanitary appurtenances. Each of these features is discussed in some detail. The standards of the Bathing Place Committee of the Conference of State Sanitary Engineers are quoted. Under "Inlets and Outlets" the author says, "There seems to be no point so neglected in the design of many swimming pools now in use as the location of inlets and outlets," and he illustrates by sketches this feature of 10 Connecticut pools. Attention is also called to the need of better ventilation and more satisfactory heating in pool rooms. In conclusion the author says, "The results of the survey by this department point clearly to the need of regulation of swimming pool design, as evidenced by the numerous haphazard and unsatisfactory conditions."—Warren J. Scott, *Conn. Health Bull.*, 40:3 (Jan.), 1926. Abstracted by S. DeM. Gage.

Hygiene and Industry—Now that the legislation has brought about a revolution in the conditions under which operatives in factories and workshops labor, the next step is to take similarly effective measures to bring adminis-

trative staff rooms and offices up to an equally high standard. This will involve work on the part of the sanitary engineer and the architect in properly designing new office buildings as well as remodeling old ones. An example of the latter, the remodeling of a printing plant in London, a century old, is given.

The report of the Chief Medical Officer for the Ministry of Health for 1923 is quoted as saying: "The loss of time due to sickness, most of which is preventable, probably costs the country not less than ten times more than that which it loses owing to strike and labor disputes."—Sidney Tatchell, *J. Roy. San. Inst.*, 46:231 (Nov.), 1925. Abstracted by D. E. Kepner.

Liability for Water Borne Disease—An account is given of the events leading up to the decision of the Supreme Court of the State of Washington in confirming judgment of the Superior Court of Snohomish County, which granted damages after jury trials to relatives of persons alleged to have died from typhoid fever contracted by drinking water furnished by the city of Everett.

Evidence was presented that during the typhoid fever epidemic in the summer of 1923, polluted water passed into the city mains through an open gate valve in a by-pass connection at an industrial plant. The points considered by the jury were whether or not the city was negligent in allowing the by-pass with a gate valve to exist; whether it was negligent in failing to remedy the condition of the water after it had been notified that it was polluted.

The city maintained that the complaints were based on an implied warranty that a safe water be furnished, but the higher court held that the complaints were based on negligence.—Homer O. Blair, *J. Am. W. W. Assn.*, 15:80 (Jan.), 1926. Abstracted by A. L. Dopmeyer.

Sterilization with Freshly Prepared Hypochlorite—A sketch is shown of the apparatus used at the Badin, N. C., filter plant for combining chlorine with an alkali, and forming a hypochlorite for sterilizing water. The apparatus consists of a liquid chlorine cylinder, galvanized iron soda solution box, glass chlorinating chamber and the necessary valves, tubing, etc., for injecting the chlorine gas into the soda solution at the proper rate. The bactericidal action is based on the breaking down of the hypochlorite giving off nascent oxygen. The cost of the entire equipment used at Badin was about $50 and it is said to be giving good results.—H. A. Lily, *J. Am. W. W. Assn.*, 15:60 (Jan.), 1926. Abstracted by A. L. Dopmeyer.

Rapid Fine Sand Filtration—The writer discusses in detail rapid fine sand water filters and presents data from such filter plants as those at Yuma, Ariz.; Calexico and El Centro, Calif.; Montreal, Canada; and the Eastman Kodak Company Works at Rochester, N. Y. According to these data, rapid fine sand filters by the combined use of fine sand, reverse flow and filter washer can purify successfully at a 25 to 50 m.g.d. rate, river water of medium turbidity, subject to occasional flood turbidities as high as 300 p.p.m., without settling; river water of medium turbidity, subject to occasional excessive flood turbidities that can be settled, with or without the use of alum; water of low turbidity such as that of the Great Lakes and their connecting rivers; and storage waters of all classes.

Principle of Rapid Fine Sand Filtration—The sand used when screened to 20-mesh has sufficient percentage of fines to accomplish the desired result. It should not be too fine, for the finer the sand the more frequent will be the necessity of reverse flows and washings. This sand, at high rates of flow, must be either dry when put into the filter or consolidated in place by agitation under water with a filter washer. The reason is, that in a dry condition, the finer grains naturally occupy the interstices between the coarser but, when wet, surface tension or the adhesion of the grains to one another prevents their normal distribution and results in a segregation of grains disadvantageous to the efficiency of the filter. The efficiency of a rapid fine sand filter depends not upon the "schmutzdecke" or bacterial action but upon the very fine surface sand, about one-eighth of an inch in thickness left after washing, which, when dried, has a velvet-like feeling, and is so fine that the process of filtration resembles that of a porous tube, or plate filters, the whole surface being equivalent in its action to a great porous plate filter.

Features of Rapid Fine Sand Filtration—

1. The cost of rapid fine sand filters varies from $3,000 to $10,000 per m.g.d. capacity depending upon the rate of filtration and roofing.

2. A special filter washer is provided which is described in detail and illustrated. No filtered water is required in washing, the raw

water used for this purpose being one-fortieth of 1 per cent of the water filtered.

3. A high percentage of removal of bacteria, turbidity and color is effected, and it is also stated that at some plants satisfactory results have been obtained in removal of taste and odor.

4. No chemist is required to operate small rapid fine sand filter plants. The flexibility of this type of filter permits of instant increase in the rate of flow from a minimum to maximum without impairing its efficiency.—Hiram W. Blaisdell, *J. Am. W. W. Assn.*, 14:581 (Dec.), 1925. Abstracted by I. W. Mendelsohn.

How to Improve Porto Rico's Milk Supply—In order to improve the milk supply of Porto Rico the Department of Health has organized an efficient inspection service and the legislature has passed a new law punishing offenders who sell milk with 500,000 bacteria per c.c. or over. The author suggests the abolishing of the 500,000 bacteria per c.c. fixed standard in favor of a *B. coli* test, setting the number of *B. coli* for a certain time (24 hours) at a given temperature. A routinary bacterial examination of milk should be established; also the fermentation method should be used in conjunction with the bacterial counts.—P. Morales Otero, *Porto Rico Health Review*, 1:3 (Nov.), 1925. Abstracted by Fred Almquist.

The Bacterial Content of Milk—The results of an investigation into the milk supply of Perth Metropolitan area by a royal commission appointed by the government of Western Australia are set forth. Comparisons are made between the milk as it arrived in the city and when it reached the consumers. Lack of special care in transit was responsible for the tremendous increase in bacterial counts. The most striking conclusion was reached concerning the quality of milk obtained by hand milking vs. machine milking. The test was markedly in favor of hand milking methods. The general conclusions of the entire investigation clearly point to the importance of the personal element in producing clean milk. The intelligent application of ordinary methods of cleanliness goes further to produce the desired result than the haphazard use of expensive apparatus. —*Med. Off.*, 34:261 (Dec. 12), 1925. Abstracted by E. S. Tisdale.

Heat Drying of Sludge at the Baltimore Sewage Works—The experience of Baltimore in converting sludge into fertilizer base over a period of 6½ years by contract with an operating company is narrated in detail.

The drying plant consisted of two heat dryers, conveyors, grinders, screens and accessories. The dryer was a rotary, boiler plate kiln 6 feet in diameter and 40 feet long with stationary shelves on the interior. A hand fired furnace at the inlet end supplied heat to the rotating kiln.

The plant was first operated by a private company under a five-year contract beginning February 15, 1916, the city to deliver air dried sludge to the contractor and to receive 81 cents per ton for the heat dried product. The net loss to the contractor, until the plant was destroyed by fire in 1917, was $2.23 per ton. After the fire the net loss per ton of heat dried sludge was 50 cents. No difficulty was encountered in disposing of the product to fertilizer companies who used it as a base for commercial fertilizer. Because of these losses a modified agreement was entered into at the end of the first contract whereby the city should pay all operation deficits. Losses continued and the city finally shut down the plant in January, 1923. Detailed financial statements and quantities of sludge treated are presented in tabular form.

During 1922 farmers hauled away 6,272 cu. yds. of air dried sludge which cost the city to load on their wagons 15 to 20 cents per ton as compared with $2.69 a ton for heat drying it.

The experience indicates that heat drying was an expensive method of sludge disposal for Baltimore. The high costs are attributed to excessive overhead expenses, cost of hauling the material to its destination, sand and gravel content of the air dried sludge and its low nitrogen (2 per cent) content.—C. E. Keefer, *Eng. News-Record*, 96:238 (Feb. 11), 1926. Abstracted by J. K. Hoskins.

Sutton, Surrey Municipal Works—House refuse was formerly tipped, but owing to unsightliness of the tips a pulverizer was installed and the pulverized material is mixed with the sewage sludge in the lagoons. It is hoped eventually to find a market for it.—H. Hedley Grieves, *Surveyor*, 68:361 (Oct. 30), 1925. Abstracted by R. E. Thompson.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M.D.*

Creation of a Prize Fund for Plant Reports Covering Industrial Hygiene Research—At the Buffalo Meeting of the American Public Health Association, George M. Price, M.D., Fellow of the Section on Industrial Hygiene and a past chairman of the Section, suggested that an incentive be offered to physicians working in industrial plants, to develop research and report the same. Dr. Price felt that the opportunities were unusually good in many industrial plants for extending our boundaries of knowledge in preventive medicine, and that much valuable information was being accumulated which never saw the light because the spirit of research needed stimulating. To this end Dr. Price offered to be one of twenty contributors who would give $50 each toward the creation of a prize fund of $1,000. The offer was duly acclaimed and the secretary of the Section was authorized to extend his official duties to cover the matter. All members and others who may care to contribute $50 toward the object should enter into correspondence directly with the Section secretary, Emery R. Hayhurst, M.D., Hamilton Hall, Ohio State University, Columbus, Ohio.

A Lecture Course for Teachers in the Principles of Safety—Through a joint arrangement by the New York State Department of Labor with the Division of Vocational Extension Education of the State Department of Education, a free lecture course especially for vocational teachers on the principles and practice of "accident prevention" has been arranged. The opportunity is extended especially to teachers in part-time or continuation schools, unit trade schools, evening vocational schools and junior high schools.

The number of employed children who are receiving education in the continuation schools is approximately 125,000. In addition about 13,000 boys and girls are being trained in various trade schools in the state, and over 50,000 men and women are in attendance upon evening vocational schools. Those in junior high schools may also be reached. Teachers who attend 13 out of the 15 lectures which constitute the course will be granted 2 hours of credit toward the 6 hours required every 3 years of such teachers. Dr. Lewis A. Wilson, Director of the Division of Vocational and Extension Education, State Education Department, Albany, N. Y., is in charge.

A complete program of lectures has been arranged extending from November 8, 1926, to March 25, 1927. The lectures may be taken in any one of the following cities: Buffalo, Rochester, Syracuse, Oswego, or Schenectady.

Occupational Diseases in Connecticut—The *Annual Report* of the Connecticut State Department of Health for 1925, pp. 34–35, records the work done in occupational diseases for the fiscal year. The last legislature was requested to make an appropriation of $10,000 for the year for this work, but no funds were granted. However, requests for assistance in connection with materials of dangerous nature which are handled in industry are so numerous that this phase of health work is urgently needed, and it is hoped that an appropriation will be made at the next legislative session. The reporting of occupational diseases at present is fragmentary, but during the year there were reported the following cases: mercury poisoning, 48; lead poisoning, 28; dermatitis, 22; eczema, 15; and 6 others scattered.

Organization and Operation in Pennsylvania—The Bureau of Industrial Standards of the State Department of Labor and Industry is organized in three sections: Accident Investigations, Hygiene and Sanitation, and Research. The bureau is primarily a research and development organization. It promulgates standards. It makes surveys concerning conditions in industry. Public hearings, field research, laboratory research, membership and participation in meetings of the professional societies, and coöperation with similar organizations in other state governments, compose its methods of operation. The bureau also supervises the approval of various kinds of safety devices and appliances. Manufacturers of devices may submit same for test and approval.

Cases of industrial diseases are investigated

* The editor of this Section will gladly receive contributions from members. Please address all communications to Hartman-Ohio Bldg., Columbus, O.

and studies instituted for removing the conditions producing them. The bureau also initiates studies of problems in hygiene and sanitation, the results of which are made public through published bulletins. By coöperation with the Bureau of Inspection, field problems brought in by the numerous factory inspectors are negotiated. In addition constant contact is maintained with individuals and agencies interested in improving the health of workers and the conditions under which they are employed.

An important recent work of the Hygiene and Sanitation Section of the bureau has been the investigation of the health hazards of spray painting. This subject has been very carefully investigated and the conclusions which will shortly be drawn, will constitute authoritative information on the subject. Display posters featuring the requirements of labor laws are another function of the bureau.

The Research Section is responsible for the drafting of new regulations and the revision of old ones. It works in correlation with the Compensation Rating Bureau and with national standardization bodies such as the American Engineering Standards Committee. The section particularly aims to be of assistance to the inspectors in solving problems which they encounter in the field. It frames the departmental bulletins. There are about 60 inspectors located throughout the state with headquarters in 7 divisional offices and central headquarters in Harrisburg.—Penn. Dept. of Labor and Industry, *Special Bull. No. 14*, 1926.

Final **Report of the Benzol Committee**—This 128 page bulletin published by the National Bureau of Casualty and Surety Underwriters for the Chemical and Rubber Sections of the National Safety Council, May, 1926, embodies the work done by the special committee and reported upon in progress reports during the past 3 years. The personnel of the committee was C.-E. A. Winslow, Yale School of Medicine, Chairman; Leonard Greenburg, U. S. Public Health Service, Vice-Chairman; W. S. Paine, Aetna Life Insurance Company, Secretary; H. Bradshaw, E. I. DuPont de Nemours and Company; J. W. S. Brady, Massachusetts General Hospital; A. C. Fieldner, U. S. Bureau of Mines; C. F. Horan, Hood Rubber Company; L. E. Weber, Consulting Chemist; J. J. Weiss, of Weiss and Downs, representing the Manufacturing Chemists' Association. Coöperating Experts, John R. Dexter, Massachusetts Department of Labor and Industries; J. Newton Shirley, Hood Rubber Company. Research Associate, J. J. Batchelor, Yale School of Medicine.

The component parts of the report are: Introduction; the chemistry and industrial uses of benzol; acute benzol poisoning; previous studies of chronic benzol poisoning; the effects of benzol upon the blood cells and its use as a therapeutic agent; the extent of the benzol hazard in American industry; the intensive study of certain selected industries; the results of medical examination and clinical tests made to discover early signs of benzol poisoning in exposed workers; experimental studies of the relative toxicity of benzol and its higher homologues (toluol, xylol, and hiflash naphtha by intraperitoneal injections, subcutaneous injections and inhalation experiments).

An excerpt from the summary states that "when the animals were exposed for 18 to 20 hours a day for 7 days to high concentrations of the four solvents, toluol and xylol were more toxic than benzol, since 1,600 p.p.m. of the former solvents proved fatal while 2,440 parts of benzol did not. This is due entirely to the narcotic influence of the solvents in question and is in accord with the general fact that narcotic action often increases with added methyl radicals. On the other hand, toluol and xylol even in this extreme concentration are almost without effect on the central nervous system or on the blood-forming organs, both of which are seriously damaged by benzol.

"In concentration of 1,000 p.p.m. or less the severe narcotic effects of xylol and toluol are practically absent and in such dilution the superiority of these substances as compared with benzol is most obvious. Even 360 parts of benzol damages the blood-cell forming organs to such an extent as almost to eliminate the white cells from the blood and causes 15 per cent loss in weight; . . ."

The general conclusion is that benzol should be substituted in industry by its less dangerous related substances so far as chronic poisoning is concerned.

An extensive bibliography accompanies it.

A similar though briefer account of the committee's work is published by Leonard Greenburg under the title of "Studies on Benzol Poisoning as an Industrial Hazard," in *Public Health Reports*, 41, 27, 28 and 30 (July 2, 9, and 23), 1926 (U. S. Pub. Health Service, Washington, D. C.).

FOOD AND DRUGS

WALTER S. FRISBIE

Vitamin A in Three Varieties of Cheese—A study of three types of cheese was made to determine the retention of vitamin A activity in the finished product, American Cheddar, Limburger and Swiss (Emmenthaler) being chosen. Tests were made on rats which had been depleted of vitamin A reserves. The animals were fed the usual basal diet described by Morgan, dry brewery yeast being fed as the source of vitamin B in 0.5 g. daily doses. Full growths were obtained in the cheese-fed rats even in those which showed ophthalmias; so it was assumed that sufficient antirachitic material was supplied by the cheese and no irradiation was conducted. The results of the test showed that rats suffering from vitamin A deficiency recovered from ophthalmias and made normal growth with the addition to their diet of one-half g. daily portions of California cream cheese (Cheddar), or of Limburger cheese (from New York). Under parallel conditions the same doses of Swiss cheese (from Switzerland) did not cure ophthalmias nor restore growth. With one g. doses, growth was normal but eye disease persisted. The deficiency of this cheese is ascribed either to the long heating and curing processes used or to selective bacterial action.—Agnes Fay Morgan, *Am. J. Physiol.*, 78, 1:11 (Sept.), 1926.

Viability of B. Acidophilus and B. Bulgaricus in the Human Intestine—Work was undertaken to add further evidence to the claims that *B. acidophilus* can be recovered in large numbers from the feces of persons ingesting the organism in the form of milk culture, and that *B. bulgaricus* under similar conditions fails to appear; and, second, to emphasize certain clinical results that follow the use of acidophilus milk. The investigation covered a period of almost two years, comprising 12 experiments, arranged in 4 groups—2 control experiments in the first group in which sweet milk was employed as the test diet, and in the second, milk soured by *Streptococcus lacticus*. The next group consisted of experiments with milk soured with several strains of *B. bulgaricus*. Group 3 was similar to group 2 except that strains of *B. acidophilus* were used in place of *B. bulgaricus*, and in the fourth group milk was soured with borderline organisms; *i.e.*, those which appear to stand between *B. acidophilus* and *B. bulgaricus*. In group 1, 8 normal persons drinking 1 quart of whole sweet milk daily for 10 days did not show at conclusion any x type colonies in fecal platings. Seven of the 8 subjects reported marked constipation. In the other experiments 1 quart freshly soured *Streptococcus lacticus* milk was fed with no development of x type colonies. All subjects reported no tendency to constipation. Six experiments in group 2 using milk culture with typical *B. bulgaricus* fed 1 quart daily for a period from 7 to 10 days failed to show any x type colonies at any time during the feeding period. Two subjects reported constipation and 2 suffered ill effects from high acidity. Five experiments in group 3 used typical *B. Acidophilus* milk in daily doses of 1 quart. After two or three days, fecal platings showed large numbers of viable *B. acidophilus*, running from 40 to 100 per cent of total colonies. In group 4 other cultures were used under similar conditions as previous experiments, one of which showed 90 to 95 per cent x type colonies at the end of the feeding period and the other no colonies. The author concludes that *B. acidophilus* strains used for therapeutic purposes should be carefully studied since the efficacy of this milk depends upon whether it is produced with typical *B. acidophilus* or an organism closely related. A strain should be selected that would develop in the intestine and appear viable in fecal platings. Experiments seem further to confirm the statement that *B. bulgaricus* will not develop in or survive passage into the intestine.—Walter L. Kulp, *Jour. A. M. A.*, 87, 11:833 (Sept. 11), 1926.

Coal-Tar Colors for Use in Foods—Certain dyes are permitted for use in food under the terms of the federal food and drugs act, and this article describes the methods employed in the Bureau of Chemistry in testing new dyes

which are to be admitted to the list of so-called "permitted" colors. Experiments on animals are conducted to determine the toxic effect and also the remote effects of continued ingestion. Explanation of the method of certification of dyes performed in the Bureau of Chemistry is also given.—E. W. Schwartze and H. T. Herrick, *Nation's Health*, 8, 9:609 (Sept.), 1926.

The Examination of Spoiled Canned Foods—The National Canners Laboratory states that when canned foods spoil from understerilization, "swells" result from anaerobic activity, and "flat sours" indicate the presence of facultative anaerobic types. The typical flat sour condition is indicated by acid fermentation with odor slightly or entirely absent and no gas. Two hundred and fourteen cultures of spore-forming, non-gasforming bacteria were studied, separated into groups viable at 37° C. but not at 55° C., at 37° C., and 55° C., and at 55° C., but not at 37° C., denoted respectively as mesophiles, facultative thermophiles and obligate thermophiles. Photomicrographs are given showing the types studied. Inoculation experiments using these three types were run in corn, peas, string beans, evaporated milk and spinach. Two large groups of thermophiles were defined as causing "flat sours." Group 80, a facultative thermophilic group, comprising 51 cultures, had been isolated from pure cultures in corn, peas, string beans, baked beans, lima beans, spinach, milk, pumpkin, hominy and potatoes, and from mixed cultures in beets. Group 100, an obligative thermophilic group, comprised 42 cultures and had been isolated in corn, hominy, milk, peas, pumpkin and string beans. Upon reinoculation, group 80 produced "flat sours" in corn, peas, hominy, potatoes, lima beans, baked beans, string beans, spinach, beets, pumpkin, milk, broccoli and asparagus. Group 100 produced "flat sours" in corn, peas and broccoli and by enzymic action, sweetness in hominy. Certain strains soured evaporated milk and string beans.—E. J. Cameron and J. R. Esty, *J. Infect. Dis.*, 39, 2:90 (Aug.), 1926.

Color Tests Suggested for Vitamin A—Two color reactions for vitamin A were studied—(1) the blue color developed by the addition of arsenious chloride (or antimony chloride) to cod liver oil; and in (2) the permanent red color produced by pyrogallol in the presence of trichloroacetic acid and an oxidizing agent. Using standard conditions for the two tests comparing the color, the Lovibond's colorimetric values were compared on a large series of oils with their growth-promoting power as tested by rat feeding experiments. It has been found that when an active oil is saponified the ether extract avoiding destruction of the labile vitamin, gives the $AsCl_3$ reaction with increased intensity, while the pyrogallol reaction is negative. The soaps retain the whole of the chromogen reacting with pyrogallol. It seems to preclude the possibility that the Fearon reaction (W. R. Fearon, *Biochem. J.*, xix:888, 1925) is related to vitamin A. For the feeding experiments two oils were selected, one, sardine oil giving a positive reaction with Fearon's reagents and none with $AsCl_3$; while the other, pig's liver fat, reacted in the opposite sense. The sardine oil giving negative $AsCl_3$ test but with the Fearon's reaction comparable to cod liver oil, was found to be entirely devoid of vitamin A, the oil failing to cause growth and no effect on xerophthalmia. The fat from pig's liver failed to react with pyrogallol but the $AsCl_3$ test indicated that it contained twice the amount of chromogen as compared with cod liver oil. The feeding test showed the oil to produce as good growth as twice the amount of cod liver oil and proved a rapid cure for xerophthalmia. Experiments seem to conclude that the Fearon test bears no relationship to the presence of vitamin A but the relationship of the chromogen reacting with $AsCl_3$ to vitamin A, is still open.—O. Rosenheim and T. A. Webster, *Lancet*, 16, 2:328 (Oct. 16), 1926.

Preservation of Vitamin C in Dried Orange Juice—Young guinea pigs were placed on a basic diet of 65 per cent ground wheat, 32 per cent whole milk powder (containing no vitamin C), 2 per cent calcium carbonate, and 1 per cent sodium chloride. This diet was modified in one case by the addition of 1 c.c. fresh orange juice daily and in the second case by the addition of ¼ g. of dried orange juice-sugar mixture, which had been kept under partial vacuum for five years. At the end of the 32-day period the control was found to exhibit evidence of scurvy while the two other pigs were healthy and normal, indicating that vitamin C in dried orange juice was effective after five years.—Gertrude J. Humphrey, *Jour. Biol. Chem.*, 69, 2:51 (Aug.), 1926.

CHILD HYGIENE

MERRILL E. CHAMPION, M.D.

Prophylactic Value of Blood of Convalescents in Measles—Conclusions:

1. It is difficult to procure a sufficient supply of blood of recent convalescents to cope with an epidemic of measles in an institution.

2. It is practical to bleed recent convalescents in small amounts to inject exposed children during an epidemic in an institution.

3. Plasma of convalescents, collected from one to four months after defervescence, and stored for four and one-half months before injection, protected 51 per cent of the children for three months or more.

4. Plasma of convalescents, collected one month after defervescence, protected 88 per cent of the children for three months or more.

5. Even when plasma of convalescents collected from one to four months after defervescence failed to protect, it modified the measles in 100 per cent of the children.

6. There was very little difference in the protective value of plasma injected from the fourth to the seventh day after exposure. When injected after the seventh day, it did not protect or modify the disease.

7. Whole blood in amounts of from 5 to 7 cc., collected up to three months after defervescence, protected 41 per cent for two months or more.

8. When whole blood collected up to three months after defervescence failed to protect, it modified the measles even when it developed two months after injection.

9. It is possible, but very rare, to have a relapse of measles within a month.

10. Considering the small amounts of plasma and whole blood that were used, an incidence of measles of 53 per cent in the children who were inoculated, as compared to 84 per cent in those who did not receive protective inoculation, is noteworthy.

11. The permanent immunity following the modification of measles is of benefit in an institution caring for children.

12. The decidedly lesser incidence of bronchopneumonia in the children who received protective inoculation, as compared to those who were not inoculated, and no mortality, were noticeable phenomena of this epidemic.

13. Convalescent blood is very valuable in institutions for infants and very young children, and in private families, where exposure to the disease is known. A real control can only be obtained by active immunization with either an attenuated virus or a toxin.—Sidney V. Haas, Julius Blum. *Jour. A. M. A.*, Aug. 21, 1926.

School Medical Inspection in Siam—A beginning in school medical inspection in Siam was made in the examination of 179 pupils in a girls' school in Bangkok. Forms suggested by the U. S. Public Health Service were used.

A large number of defects were discovered, most of which were of a minor nature, but still needing correction. Some statistical information was also secured.

An aggressive start was made in correcting the defects found.—Henry R. O'Brien, M.D., *J. Med. Assn. of Siam*, 8:1, Apr., 1925.

Emotional Handicaps to Intellectual Achievement in Supernormal Children—In this paper read at the Second Annual Convention of the American Orthopsychiatric Association in New York City in June, 1926, the author discusses the problems of children of high intelligence quotients who are yet failing in school or are suffering under the strain of emotional problems. That this group of school failures is large enough to warrant special attention is shown by the records of the Bureau of Child Guidance. About 90, or 15 per cent of the cases referred to the bureau during the four and a half years since its establishment, are in the supernormal group. Although all but 8 of these children were referred because they manifested undesirable behavior symptoms, it was found that in addition one-third of the group were failing in one or more school subjects. Case histories from the bureau records are cited to illustrate various aspects of the problems involved. Attention is called to the importance of mapping out a plan for a supernormal child, of duly considering his all-round

development, and recognizing the dangers inherent in too rapid advancement.—Jeannette Regensburg, *Ment. Hyg.*, July, 1926. Quoted by *Child Welfare News Summary*, Children's Bureau, Oct. 27, 1926.

Ghosts and How to Lay Them—The whole idea can be summed up in teaching children "safety first" in thinking before they allow emotion a free rein.

Mental hygiene, that is, teaching the child control of motor responses through the watch tower of the brain, is a necessary part of successful conduct.

However, aside from the writer's idea, too much inhibition according to Puritan principles causes an unadjusted child mind and dammed up emotions which break through the dykes of control to disastrous consequences.

The writer sensibly holds that the understanding of one's own psychology of mental and emotional control does help toward happy adjustment.—*Good Health*, Nov., 1926.

Measles Prophylaxis. Report on the Use of Immune Goat Serum—Tunnicliff's immune measles serum (goat) has been, in our experience, of definite value as a prophylactic for measles.

If the serum is administered to contacts not later than the fifth day of exposure, always counting the date of onset as the first day of the disease, protection seems assured in about 90 per cent.

Those who receive serum early, yet are not wholly protected, pass through an attenuated form of the disease.

Passive immunity endures from 2 to 4 weeks and in some instances even longer. One of us observed a child who was placed, through error, in a measles ward 2 weeks after he had received 7 c.c. of immune goat serum intramuscularly. This child, because of his close contact with many cases of measles in all stages of the disease, was believed to be hopelessly exposed and so was not removed from the ward, where he remained for more than 2 weeks. He did not contract measles.

The serum produced no deleterious effects, regardless of age or physical condition of the patients in whom it was used.

The advantages of the Tunnicliff serum, as compared with convalescent measles serum, are evident when the question of supply is considered. Ultimately, it is hoped, the Tunnicliff serum will be easily available for all who desire it, whereas a similar situation can scarcely be hoped for in respect to convalescent serum.—Hoyne and Gasul, *Jour. A. M. A.*, Oct. 9, 1926.

The Tired Child as a Forerunner of the Fatigued Adult—We are all acquainted with the fact that a tremendous per cent of children and adults are unfit physically. The apathy that exists in the human mind toward this fact is at present inexcusable.

The formation of health habits for the child is not a new idea but the emphasis on the prevention of fatigue is refreshing. The outline of procedure to accomplish this is a bit unusual and interesting.

A. Rôle of the Home
   1. A knowledge of the family history
   2. Recognition of inferior types (the nervous and the asthenic child)
   3. A knowledge of the causes of chronic fatigue
   4. Establishment of adequate physical and mental health habits
   5. Improvement of the general health
   6. Prevention of repeated attacks of acute fatigue due to
      a. Emotional overstrain
      b. Inadequate health habits
      c. Organic disease

B. Rôle of the School
   1. Equalization of the physiological and chronological age of the child
   2. Substitution of the dynamic for the static system
   3. Replacement of the lock step system by one that considers the aptitude of the individual child
   4. The establishment of a larger number of special classes
   5. Improved room facilities
   6. Vocational selection and guidance
   7. Conservation of eyesight, hearing, and posture
   8. Education in the technic of mental work (rhythm, rate, speed) and in the proper use of tools and instruments
   9. Creation of the necessary motive and interest in work based upon the laws of growth and development
   10. A reduction to a minimum of nerve tensions
   11. Frequent periods of rest and recesses
   12. Physical education every day and for all children
   13. Attention to the health of the teachers

It is not by knowledge alone but by the conscientious use of this knowledge that we are going to learn and achieve real disease prevention.—Max Seham, M.D., Professor of Pediatrics, University of Minnesota, Minneapolis, Minnesota. *Nation's Health*, Nov., 1926.

Posture and Health—In making observations in busy city streets of posture in the general ebb and flow of people, the writer has seen an interesting variety There are a few who move with "ease and beauty," some of them in inexpensive clothes. The deductions are that good posture and good proportion sanctify a bargain basement costume.

However, aside from looks good posture is needed for the following reasons:

The mental effect
For full health
Gives children room to grow

The points of good posture:

Head erect—chin in
Back straight
Shoulders even
Chest high
Abdomen flat
Weight carried easily over center of feet

Poor posture may begin in babyhood. Older children need play apparatus which tends to develop the extremities. Improper diet, lacking growth essentials, affect posture. Physical defects and any other factor which tends to produce a continued poor position may be detrimental. Sound suggestion is to consult the physician about the underlying cause so that a careful corrective procedure may result. If necessary, consult an orthopedist. It is essential to create a postural ideal in the child's mind. Hero worship, constant example and silhouette studies are a few means to this end.—Posture and Health, by Ethel Perrin and Alice Fisher Loomis. *Child Welfare Mag.*, Nov., 1926.

The Work of a French Magistrate for Child Welfare—A circular letter has been sent to all justices and mayors in the administrative area of M. Larocque, Recorder of Nantes, emphasizing the serious evil done to society by the abandoning of young children and by the abandonment of pregnant women by those who ought to stand by them. By lightening the burdens and alleviating the duties of unfortunate women it is hoped that there will be fewer children thrown on to the poor law and a lowered rate of infanticide. It will be the duty of mayors and commissioners of police to give moral help to women, especially deserted girls, by trying to persuade parents to give material support; also information to deserted and needy mothers as to institutional care is given out by the same officials.

This matter is really an enforcement of a law of February, 1924, which provides penalty for the offense of desertion.—Dr. Henri Vignes. *Mat. & Child Welfare*, Oct., 1926.

Diphtheria Deaths—The District Health Officers of the Massachusetts Department of Public Health investigated "Thirteen Unnecessary Deaths" occurring from diphtheria in 1926. According to the information collected the responsibility for these deaths lay definitely with the parents in all but two instances. The parent or guardian in these 10 cases failed to call the physician until the child had been sick at least 4 days, and in one other case the parent allowed the child to get out of bed against the doctor's advice, death following from myocarditis.

In 1 of the remaining 2 cases an acute nephritis figured largely in the fatal outcome and in the other case the physician was apparently at fault as the infection was laryngeal with successive negative cultures and the physician failed to give antitoxin.

The conclusions drawn are as follows:

Parents should call a physician immediately whenever a child has a sore throat.

Physicians should give antitoxin without waiting for a culture report whenever the clinical findings arouse a suspicion that the case may be diphtheria.

The initial dose of antitoxin should be large enough to protect the patient against the disease without the necessity of further antitoxin injections.—*Boston M. & S. Jour.*, Nov. 4, 1926.

Dentist Must Back Up Public Health Workers in the Care of First Teeth—The fact is, that while our writers and lecturers have been telling the people that the deciduous teeth must remain until such time as their successors are due to appear, it is too frequently the case that, when parents take their children to the dentist, they are told the deciduous teeth are so soon to be lost that there is no necessity to insert fillings or to put forth any extra effort to save them. The teachings of the writers and the practice of the operators do not tally, and there is doubt and confusion in the minds of the parents. If any fact is well established in dentistry, it is that the deciduous teeth have an important function and a definite field of use-

fulness, and that they should be preserved till this function is fulfilled.

The present situation is not only illogical and unjust, but it actually places the profession in a most ridiculous position before the public. We owe it to the children in the light of what we have been teaching and in the light of what is right and honorable, that we accept the responsibility for the proper care of their teeth, and not until this conviction finds lodgment in the hearts and minds of the rank and file of the profession, can we truly be said to have made good in the estimate of the world.—Dentistry's Most Neglected Obligation, Correlating Preaching and Practice. *Dental Cosmos*, Nov., 1926.

The Shriner's Hospitals—Summary of the History of the Founding of the Shriners' Hospital for Crippled Children.—At the forty-sixth annual meeting of the Imperial Council, Ancient Arabic Order Nobles of the Mystic Shrine, held in Portland, Oregon, in June, 1920, Honorable W. Freeland Kendrick of Philadelphia, Imperial Potentate of the Shrine, introduced a resolution that the shrine undertake the establishment of a centrally located home where unfortunate children of North America might find a haven. The home idea was changed to the plan of establishing a Shriner's Hospital for Crippled Children to be supported by members on an annual per capita basis.

Plans were made for immediate construction of hospitals (with a capacity ranging from 50 to 100 beds) in the following places: Shreveport, La.; Twin Cities, Minn.; San Francisco, Calif.; Portland, Ore.; St. Louis, Mo.; Philadelphia, Pa.; Montreal, Que.; Springfield, Mass.

In addition to the above locations, mobile units have been organized in: Honolulu, T.H.; Spokane, Wash.; Salt Lake City, Utah, and Winnipeg, Man., each having a capacity of 25 beds, and special arrangements were made with already existing hospitals which had facilities for carrying on the work efficiently, to do the work in the sparsely settled sections of the country. Statistics show that 50 per cent of the children were entering hospitals because of poliomyelitis, hence it was decided to establish a research department in connection with the St. Louis unit.

Educational, vocational and recreational sides of work are also developed as it is realized that the benefit of the best surgical treatment should be further supplemented if the whole program is to be adequately handled.

Requirements for Admission—The child must, upon examination by the chief surgeon, be found to have normal mentality, a condition which can be cured or corrected to such an extent as to render the child self-supporting in after life, and the parents must be unable to pay. These hospitals are not primarily for Shriners' children, as appears to be the general impression; the broad principles upon which they are founded will be understood when it is pointed out that religious creed, and fraternal affiliations do not enter into the question. No time limit is placed upon any child's stay in the hospital.

Organization—The hospitals organized include the following: The board of trustees whose members reside in widely separated parts of the United States and Canada meet every three months in localities where Shriners' Hospitals for Crippled Children are, or are about to be established.

Board of Governors—In each locality where one of these hospitals is established there is a local board of governors, elected by the board of trustees.

Advisory Board of Orthopedic Surgeons—The board nominates the chief surgeons of the various hospitals to the board of trustees; they advise and make suggestions to the chief surgeons of the hospitals in accordance with their high ideals and conception of the work.

The director of nursing, together with other duties, directs the nursing of all the Shriners' Hospitals for Crippled Children and is the authorized means of communication between the nursing department and each hospital, the board of trustees and the advisory board of orthopedic surgeons.

Staff—Each unit is staffed as follows: chief surgeon, assistant surgeon, resident surgeon, superintendent, who is a graduate nurse, assistant superintendent, graduate nurses in charge of the wards and various departments, physiotherapists, occupational therapists and school teachers, X-ray and laboratory technicians.

The woman's auxiliaries play a very important part in the organization of this group of hospitals. They are organized for a definite piece of work and there is a distinct understanding that no woman can be a member of the auxiliary unless she is willing to assume her share of responsibility in making the auxiliary a success.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN *

SCHOOLS AND CHILDREN

Articles on Children's Food Antipathies. *Trained Nurse and Hospital Review*, June, 1926. Women's groups may thank you for a copy of this list of references.

Child Health Club. *Monthly Bulletin*, Indiana Board of Health, May, 1926. A state project.

Child Hygiene. A Program for Activity and Study, with References. By Mary E. Murphy. *Child Welfare Magazine*, 5517 Germantown Ave., Philadelphia, Sept., 1926. 10 cents. First of a series for parent-teacher associations and similar groups.

Day Nurseries Supply Art Class Problems. *Nation's Health*, Aug., 1926, 8:549–551. Suggests the possibility that clinics and health centers may gain attractiveness through school coöperation.

Four-Year Trial Proves Value of Child Health Car. *Nation's Health*, May, 1926. Public health significance of the Wisconsin "Child Welfare Special."

Gifts of Spring. By Mildred E. Reeve. *Journal of Social Hygiene*, March, 1926. An experiment in use of living creatures in social hygiene in an elementary girls' school.

Health Score Card for Boys. *Bulletin*, National Tuberculosis Association, Aug., 1926. A self-scoring card from Hartford.

Health Training in North Carolina. By L. B. McBrayer and Theresa Dansdill. *Hygeia*, June, 1926. Incidents illustrating health activities among children. 6 illus.

Hospital Parties in Successful Shamokin Program. *Bulletin*, Pennsylvania Tuberculosis Society, Aug., 1926. "Great fun" in removing tonsils, adenoids and teeth.

Little Mothers' Leagues. By H. E. Kleinschmidt. *Journal of Social Hygiene*, March, 1926. Their significance as a method.

The Rural School Health Program. By Florence A. Sherman. *Child Welfare Magazine*, 5517 Germantown Ave., Philadelphia, Sept., 1926. 10 cents. Detailed suggestions; of interest to those working with group of parents or teachers.

The School Paper as a Health Messenger. By Ida Spaeth. *Public Health Nurse*, Sept., 1926. The use of student periodicals (grammar school in this instance) by health workers. Illustrated. The real advertisements of plumber and meat market show how advertising can be educational.

"Stop for Health." *Nation's Health*, May, 1926. Picture of near life-size cut-out of a clown "traffic officer" which stands at entrance to the children's clinic of the University of California Hospital's out-patient department.

Suggested Methods for Teaching Mouth Hygiene and Nutrition. By Rose E. House. *Journal of American Dental Association*, Sept., 1926. As done in Bridgeport.

Teaching Health to Children. By Marjorie Delavan. *Public Health*, Michigan Department of Health, Aug., 1926. As told to the Congress of Parents and Teachers.

EDUCATIONAL MATERIAL

As the information becomes available this department will announce new lists of publications issued from national sources. Publishers would increase the usability of their lists of publications: First, by starring or otherwise indicating the new items and the revised editions; second, by dating the lists so that one may know which is the latest.

List of Publications. American Social Hygiene Association, 370 Seventh Ave., New York. June, 1926. 16 pages. Free.

Publications. U. S. Public Health Service, Washington. Titles issued Nov., 1925–March, 1926. Free. Also in *Public Health Reports*, April 9, 1926.

The Care of the Feet, a four-page folder with blank for insertion of name of parent, to whom it is addressed, and name of the school. Department of Health, Toronto.

Foot Health. Metropolitan Life Insurance Co. 16 page pamphlet for young people and adults. Free.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York City.

Health Ideas in Kalevala. *Trained Nurse*, Aug., 1926. Not health literature, but health in literature—from Finland.

Poster stamps or stickers issued by Division of Child Hygiene, Ohio Department of Health. Twenty thousand furnished to May Day chairmen and county health officers. Mats supplied for reproduction in newspapers. Samples free.

Recreation Score Card. Educational Recreation Institute, 510 Wellington Ave., Chicago. Sample 4 cents. The harmful or helpful effect of any given form of recreation upon health is recognized.

So Is the Tree Inclined. Metropolitan Life Insurance Co. Eleven-page pamphlet on building your little child's mental health. Free.

Tuberculosis, Its Nature and Prevention. Revised May, 1926. U. S. Public Health Service. Includes list of P. H. S. publications on tuberculosis. 17 pages. Superintendent of Documents, Washington. 5 cents.

Twenty-six don'ts and a do. Eight-page booklet on fire prevention. Cost comparisons useful when trying to show cost of death and disease. Insurance Company of North America, Philadelphia. Free.

PRESS

The public is not interested in what you talked *about*. What you *said about something* is the significant thing in a news report of an address. Extracts, not outlines, should make up the news story. Then you can "get your message across," or a segment of it.

The Country Newspaper and the Rural Nurse. By Elise Van Ness. *Public Health Nurse*, Oct., 1926. For those doing small town publicity.

BULLETINS

Health Publicity and Education. By Herman N. Bundesen. *Hospital Social Service*, Oct., 1926. Seven conclusions on making a departmental health bulletin useful.

House Organs for Year-Around Publicity. By William Feather. *Survey*, July 15, 1926. Some practical suggestions for bulletin publishers.

Baltimore Health News, City Health Department, has Sept.–Oct., 1926, issue illustrated with outline sketches, and a rat poster from the U. S. Public Health Service.

Dental Hygiene number of *Commonhealth*, Massachusetts Department of Health. July–Sept., 1926. Includes "Dental Health Education," by Eleanor Gallinger. "Whom to Educate," "How to Reach Them," "What to Tell Them," "How to Tell Them."

The Crusader, Wisconsin Anti-Tuberculosis Association, Oct., 1926. A two-page supplement on "Wonders of the Human Body—Its Wonderful Pump (the heart)." The Good Health Calendar supplement also presents "Your Heart" as "like a great double force pump."

Health Bulletin, Brookline Board of Health, continues to reproduce selections from a cartoon contest.

"When You Have Finished Reading This Post It on Your Bulletin Board"—at the top of the first page of *Industrial Hygiene Bulletin*, New York State Department of Labor.

"Milk—Because of misleading statements, published as a paid advertisement in the daily papers, it was thought necessary to make the following reply." Then follows an answer to the specific criticisms of pasteurization and the local regulation of milk supplies. *Monthly Bulletin*, Board of Health, Fall River, Mass., Aug., 1926. Did this reply reach the people who needed to be reached in answering the advertised criticisms?

Public Health News, New Jersey Department of Health, is presenting in successive issues high lights of the annual report of the department.

POPULAR ARTICLES

Before the Baby Comes. By Joseph B. De Lee. *Delineator*, Oct., 1926.

Fit to Win. By Mary K. Browne. *Colliers*, Oct. 16, 1926. Tennis Champions point the way.

"Fresh Air" for a City's Poor Children. By Helen Hart. *American Review of Reviews*, Sept., 1926. 7 illus.

Give Your Doctor a Chance. *Colliers*, Nov. 6, 1926. Editorial broadside on health examinations.

Health Has Its Dollar Value, Too. By Dr. S. J. Crumbine. *Nation's Business*, Washington, D. C., July, 1926. 35 cents. "Is health of any interest to the business man? Does poor health decrease profits? Does good health increase profits?" With evidence to support the affirmative.

Help for the Doctors. *Saturday Evening Post*, May 22, 1926. Editorial on lay coöperation.

Lucky the Man with a Nagging Wife. By Eugene Lyman Fisk. *New York World Magazine*, Oct. 3, 1926. "He will live longer than the most carefree bachelor and his health will be greatly improved by the Empress of the Household."

"Ouch!" By William S. Sadler. *American*

Magazine, Oct., 1926. "Aches are really friendly voices trying to tell you that something is wrong."

The Possibilities and Dangers of Beauty Operations. By Joseph Colt Bloodgood. *Delineator,* Oct., 1926.

Startling Dangers in the Mad Race to Get Thin. By Trudy Jopp. *New York World Magazine,* Sept. 19, 1926.

NEW MAGAZINES

Archives of Disease in Childhood, British Medical Association, Tavistock Square, London, W. C. 1.

Children—The Magazine for Parents, 353 Fourth Ave., New York. To help fathers and mothers in the care and training of children.

Health and Empire. British Social Hygiene Council, 10 Orange St., Leicester Square, London, W. C. 2. 10 s. per annum.

New Health. New Health Society, 46 Southampton Row, London, W. C. 1. 6d. monthly.

Revue Internationale de L'Enfant. Geneva, Switzerland.

"Meet Father Syracuse"—"An imaginary person known as Father Syracuse made his first appearance on a billboard along one of the main automobile highways on the outskirts of the city where he stands in colonial garb against the sky line of Syracuse pointing to the slogan 'Have a Health Examination by your Physician Every Year.' Motorists entering the city are also greeted with the Health Demonstration motto, 'Syracuse Wishes You Well,' which is printed at the top of the billboard.

"Father Syracuse next made himself seen at the State Fair, where he gave the same advice his pictured self had given on the billboard. At the same time a poster bearing a similar picture was published and distributed in local street cars, store windows, and other public places. The Health Department and the Onondaga Health Association are responsible for these forms of educational publicity." *Better Health,* Syracuse Department of Health, Sept., 1926.

OPPORTUNITIES

National organizations and others with personal hygiene material usable by school teachers and gymnasium directors may find an avenue for publication through Wm. A. Sticher, editor of *Mind and Body,* 40 East Walnut Lane, Germantown Lane, Philadelphia. Material used will reach an influential audience.

TITLES

Better Parents—Better Children. Cossitt Library, Memphis.

Every Diphtheria Death Is Due to Neglect. Virginia Health Department press release. Oct. 26, 1926.

Like "Kids"? Help Keep 'em Healthy. *Cleveland Community Fund News.*

Piloting the Way to Slimness. *Popular Health Magazine,* Sept., 1926.

String, Doorknob and Nerve, No Longer the Thing; A Village Saved Last Year (reduced tuberculosis death rate); Traffic Control for Contagious Disease Germs. *Crusader,* Wisconsin Anti-Tuberculosis Association, Oct., 1926.

When the Whole World Seems Blue Perhaps It's Bronchitis. *Popular Health Magazine,* Oct., 1926.

Wise Hirams—Foolish Jonathans. *Child Welfare Magazine,* Oct., 1926.

Do some of the titles appearing from month to month suggest possibilities for educational material?

Do some of these titles stir the imagination to create other and possibly more alluring titles—with text that will justify the titles?

In some cases the original material may be utilized for further educational uses.

"Babies Don't Take Care of Themselves." An advertisement.

"Bootleg Milk." *New York State Journal of Medicine.*

"'Born Tired.'" Cereal advertisement.

"Dead Heats and the Race to the Crossing." *Travelers Standard,* Hartford, Conn., June, 1926. Free.

"Good News—Nine Extra Years of Life." Booklet of Metropolitan Life Insurance Co.

"Keeping Well People Well." An advertisement.

"My New Boss—Myself." *Sunbeams,* Catawba Sanatorium, Va., Aug., 1926. 10 cents.

"When the Skin Goes on a Strike." *Popular Health Magazine,* Sept., 1926.

Christmas Is Coming!—And now is the time for all good men who wish to delight their nurse and hospital friends to secure copies of the 1927 "Hospital in Poetry" calendar issued by the National League of Nursing Education, 370 Seventh Ave., New York City. Among the titles are "Strictly Germ-proof," by Arthur Guiterman, and "A Nurse's Nightmare." $1.00; 75 cents for 50 or more. At least send for a descriptive leaflet.

DATES AHEAD—JANUARY, 1927

Midwinter school holidays

Intensive Educational Campaign Against *Typhoid*—Proposed by Conference of State and Provincial Health Authorities. Address: Any public health agency.

1 —New Year's Day

17-23—Thrift Week. Address: National Council of Y. M. C. A., 347 Madison Ave., New York, N. Y.

30 —Child Labor Sunday (also Saturday and Monday). Address: National Child Labor Committee, 215 Fourth Ave., New York, N. Y.

The midwinter school holidays may bring a popular school athlete who can be used for a brief talk at some meeting. Thrift Week may be a time to urge care of the health for thrift purposes. And the last of January there may provide an opportunity for urging the health aspect of child labor.

FOLKS WE SHOULD KNOW

Anna M. Drake is assistant secretary and director of health education, Public Health Federation, Cincinnati, Ohio.

Mrs. Lloyd George is editorial assistant, American Social Hygiene Association.

Dorothy Siedler is education secretary, Queensboro Tuberculosis and Health Association, New York City.

Dr. Helen Vincent McLean has joined the lecture staff of the Chicago Social Hygiene Council.

A Publicity Conference Report—Last January presidents and other representatives of Methodist colleges reached New York two days in advance of their regular annual session. They came for a publicity and advertising conference directed by Dwight R. Furness. They had sessions morning, afternoon and night—and voted to do it again next year! They used the familiar "clinic" method in several sessions. Recently a condensed report has been issued in classified loose-leaf form for filing and ready reference. A limited number of sets were made up in portfolio form to make them all the more useful to non-professional publicity workers in the colleges. The plan may have possibilities for state and national agencies, which would like to prepare reports in usable form of some of the technically useful features of conventions. A few sets of the report are available to first applicants to Mr. Furness at the M. E. Board of Education, 740 Rush Street, Chicago, Ill.

Fathers Enlisted for Infant Welfare—At the Royal Institute of Public Health Congress Dr. D. H. Geffin reported that in talks to fathers in connection with maternity and child welfare centers "he dealt with breast-feeding and the father's coöperation in securing the regularity of this, the prevention of rickets, the prevention of consumption, and had practical demonstrations arranged for the fathers on the making of child furniture, such as a cot for baby, made out of a banana crate. Summer diarrhoea, infectious diseases in children, tonsils and adenoids, vaccination, were among other subjects which he had found very acceptable to fathers." *National Health*, London, July, 1926.

Lest This Was Overlooked—"How can the fundamental facts regarding the causes of disease be more readily made the common knowledge of all the people? With the knowledge that we now have regarding the causes and prevention of disease it does seem as though such knowledge should be the possession of every educated person. Yet we see men who are bachelors of art, masters of art, and doctors of philosophy, who are ignorant of the most fundamental principles of preventive medicine."—Public Health Problems Needing Research. By Ennion G. Williams. AMERICAN JOURNAL OF PUBLIC HEALTH, Sept., 1926.

PUBLIC SPEAKING

Common Ailments Which Affect Children of School Age. *National Health*, London, June, 1926. Address to mothers: notes for speakers.

Good Teeth for Every Child—by A. C. Mitchell. Bureau of Child Hygiene, Texas State Board of Health. Mimeographed chalk-talk with illustrations usable by an artist of fair ability.

The Social Hygiene Committee of the National Congress of Parents and Teachers reports 1,244 talks to 135,530 parents and teachers during the past year.

HEALTH COLUMNS

Dr. Morris Fishbein, editor of the *Journal of the American Medical Association*, has been signed by NEA Service, Inc., New York and Cleveland, to write a daily series of articles on health. The new series will replace the health talks by Dr. Hugh S. Cumming, surgeon general, U. S. Public Health Service. The press of official duties prevented Dr. Cumming from continuing.—*Ed. & Pub.*, Aug. 14, 1926.

LISTS

American Foundations. Revised, 1926. Russell Sage Foundation, 130 East 22d St., New York. 48 pages. 35 cents. Brief descriptions of foundations; references to information; list of community trusts.

City Health Officers, 1926. *Public Health Reports*, Aug. 13, 1926.

Labor organizations and labor periodicals, in American Labor Year Book, 1926. Rand School of Social Science, 7 East 15th Street, New York, N. Y.

Negro national organizations, newspapers and other periodicals, etc., in Negro Year Book, 1925–1926. Negro Year Book Co., Tuskegee Institute, Ala.

State and Insular Health Authorities, 1926. *Public Health Reports*, Aug. 27, 1926.

MAILING LISTS

How the Connecticut State Department of Health checks against waste circulation. A double postal card, one-half of which carries these words: "You have been receiving the *Weekly Morbidity Report* issued by this Department. We are revising our mailing list of these receiving this Bulletin. Please return the attached postal at once if you desire your name retained on the mailing list for the *Weekly Morbidity Bulletin.*"

CAMPAIGNS

Health Week in Hull. *National Health*, London, May, 1926. "The net cost . . . was approximately 100 pounds. A total of 10,870 people were addressed. . . . Therefore," the net cost was just over 2d. per person addressed.

May Day—National Child Health Day—1926. American Child Health Association, New York. "A summary of nation-wide organization, coöperation and activities." Grouped under National Publicity, Festivals Clinics, Health Talks, Radio, Churches, Window Displays, etc. 36 pages. Free.

Why We Have a National Hospital Day. *Trained Nurse*, Aug., 1926. A "before and after" cartoon by Ding.

TIMELY TOPICS

Every reader will settle for himself *when* these topics are timely. Some may clip or copy them, and file under the months when it would be desirable to use them.

Avoiding Accidents During the Hunting Season. *Travelers Standard*, Oct., 1926.

Common Sense in Mouth Hygiene. By William M. Gardner. *Hygeia*, Oct., 1926. Good and bad types of toothbrushes, etc.

The Economics of Public Health. By F. E. Fremantle. *Health and Empire*, June, 1926. The value of public health in terms of dollars and pounds.

Hordes of visitors to tuberculosis sanatoriums, are objected to by *Journal-Lancet*. A timely topic in some communities?

Keeping Well in Cold Weather. Press release, Oregon State Board of Health.

Milk Is Most Valuable Food But It Should Be Pasteurized. By Dr. C. H. Mayo. *Northwestern Health Journal*, St. Paul, Nov., 1926.

Oysters Are Here. Press release No. 111. Maryland Department of Health.

Walking. Oregon Board of Health. Press release. Sept. 28, 1926.

What Should the Educated Person Know About Health. A Health Decalogue. By Livingston Farrand. *Child Health Bulletin*, Sept., 1926. The widely distributed Ten Health Commandments with which every intelligent person should be familiar.

CHARACTERS

Much teaching can be done through the mouths of created characters. Commercial advertisers have made the same discovery.

"Bailey Told Me," with a sketch of Bailey, a pipe-smoking miner, is followed by "To be very careful and not to put my hands on top of the car, when dumping rock in tight places." *The Anode*, Anaconda Copper Mining Co., Butte, Mont.

"The Health Gnome Says ——," and says it in verse in *Listening Post*, Pennsylvania Department of Health. A sketch of the H. G. appears in each issue.

In "As to Breakfasts" the Health Gnome "gets a 'concern' over things that aren't going as they should," speaking for the Bureau of Child Hygiene, Maryland Department of Health. Press release Oct. 4, 1926. Get sample for the type of copy writing.

REQUESTS

Do any state departments or private agencies arrange to supply leaflets or booklets in answer to requests directed to the editors of local newspapers?

Does any department or other health agency —national, state or local—get help from outside its staff—either paid or volunteer in planning and writing its annual report?

LAW AND LEGISLATION

JAMES A. TOBEY, LL.B.

Milk and Politics—The mixture of milk with politics is not a felicitous one when the issue happens to be artificial. This fact was amply demonstrated during the recent gubernatorial elections in New York, where an attempt was made to use milk as a political asset. The hue and cry about "adulterated" and "poisoned" milk turned out to be a liability for the candidate who dragged this false accusation into the campaign. For a while it enlivened what threatened to be a dull and colorless contest, but in the end the charges that the milk supply of New York City was mostly below the standards of the Sanitary Code, being obviously unfounded, or based on flimsy evidence, reacted to the disadvantage of the candidate and his supporters who tried to make political capital out of a public health matter. This is as it should be. Regardless of one's political creed and convictions, there can be no condonation for a spurious and reckless disregard of matters which belong to the province of sanitary science.

The milk situation in New York City was certainly open to question during the régime of Mayor Hylan and one of the first acts of Health Commissioner Harris, who was appointed about a year ago by Mayor Walker, was to attempt to clean it up. The result has been that several persons have been convicted of dishonesty in connection with this milk scandal and are now serving merited terms in the penitentiary. A special investigator, a well known lawyer who happens to be of a different political faith than the Mayor, was appointed by his honor and is now functioning, with the active coöperation of the Health Commissioner.

The Republican candidate for Governor, apparently spurred on by Mr. Hearst, whose political proclivities can be characterized only by the unsavory term of "Hearstism," proceeded to have samples of milk collected and analyzed, but not interpreted, by a commercial laboratory of good standing. The candidate then charged that most of these tested samples indicated that the milk of New York City was generally below standard. The tests showed that in some cases the milk did not contain the exact amount of butter fat required by the Sanitary Code. There was no evidence of bacterial contamination. This onslaught on the milk supply apparently frightened many persons, however, and a reduction in the consumption of milk, the one nearly perfect food, was noted. This in itself was harmful to the public health.

The Health Commissioner acted with considerable restraint, but, as was his duty, publicly denied the charges of bad milk. The crowning blow came when the ranting candidate's own chemist came out with a statement upholding the quality of the milk supply. The farmers up state also got a little excited when they began to be able to sell less milk to the city. As a result of these factors as well as many others, the milk-in-politics candidate was defeated decisively, completely and by a plurality of about 250,000. The present Governor, who has always been a staunch supporter of public health, was elected for the fourth time.

The lesson from this little episode is this: *Leave public health to sanitarians and scientists, not to politicians.*

(Many requests for the reprint "Politics and the Public Health" have been received. Copies are still available and may be obtained from the associate editor.)

A Court Decision on Milk—Pasteurization laws have come before the courts on at least 6 occasions and in 5 instances have been sustained. In April of this year the Supreme Court of Missouri refused to uphold an ordinance of the City of St. Louis requiring all milk to be pasteurized, unless certified. State ex rel. Knese vs. Kinsey, 282 S. W. 437. The reason for this decision was that the state law, in the opinion of the court, authorized the sale of raw milk. The court further decided from the evidence that "raw milk is healthful, nutritious food, particularly for children, and this is not disputed," also that "it is plain that raw milk as a *general thing* is more nutritious, easier assimilated, and better food, especially

for children, than pasteurized milk, though it is probable that some individuals may thrive better on pasteurized and boiled milk, than on raw milk."

The ordinance was consequently held unreasonable and a writ of mandamus was allowed requiring the board of public service to issue permits to various dealers to sell milk, the permits having been refused by the board because the milk in question was not pasteurized.

This decision, while destructive to the cause of safe milk in St. Louis and in Missouri, should not be considered as a legal setback to the entirely reasonable and valid requirement that all milk not certified should be pasteurized. In the first place, perusal of the opinion shows that the ordinance in question was very defectively drafted, and second, that the case was very poorly presented from the standpoint of the city. The court is not to be blamed for drawing the erroneous conclusion that raw milk is better than pasteurized milk, when insufficient competent evidence was introduced to show otherwise. Instead of proving that milk, no matter how clean, is not necessarily safe unless pasteurized, the city tried to show that insanitary conditions prevailed at the particular dairies in question, alleging such trivialities as that chickens and geese were about on the farms. Quite properly, the court ruled this as irrelevant.

This case is a most striking example of the necessity for sanitarians to know something about public health law. The cause of public health in Missouri receives a check because the authorities did not support their position by worthwhile facts. The court, being an instrument of justice, would have given due weight to facts showing that raw milk could not safely be used in St. Louis, and, in fact, so stated in its opinion. In the absence of such facts, the court could rule only in accordance with the evidence presented.

Public Health in State Constitutions—Provisions pertaining to public health are to be found in the constitutions of only 9 states: California, Delaware, Florida, Louisiana, Oklahoma, South Carolina, Texas, Washington, and Wyoming. These provisions are given in full in *Public Health Reports* for September 24, 1926, and reprinted in the *United States Daily* for October 7 and 8. Public health need not be specifically mentioned in a state constitution, as the care of the public health belongs to the state as part of its inherent police power, but it is useful for this instrument to set forth the requirement that a state health organization be created by the legislature. It is not wise, however, for a constitution to go into specific details as to how the board or department shall be made up and into details as to administrative procedure. That should be left to the law-making body, the legislature.

Bureau Changes at the Public Health Service—Two new assistant surgeons general have been appointed in the United States Public Health Service and one has been reappointed. The new incumbents are Dr. Thomas Parran, Jr., who succeeds Dr. Mark J. White in charge of the Division of Venereal Diseases, and Dr. Claude C. Pierce, who takes charge of the Division of Sanitary Reports and Statistics in place of Dr. B. J. Lloyd. Dr. Warren F. Draper has been reassigned as assistant surgeon general in charge of the Division of Domestic Quarantine. Dr. Pierce has had previous service as an assistant surgeon general, having formerly been at the head of the Venereal Disease Division. Sanitarians will be well pleased with these excellent appointments.

Survey of St. Elizabeths Hospital—A special committee to conduct a survey of St. Elizabeths, the Government Hospital for the Insane, was recently appointed by the Secretary of the Interior and is now ready to report. Those invited to serve included: Dr. Harry W. Mitchell and Dr. Owen Copp, Pennsylvania; Dr. George M. Kline, Massachusetts; Dr. Arthur H. Ruggles, Rhode Island, and Dr. Samuel E. Smith, Indiana. The committee endeavored to ascertain whether medical and nursing service is sufficient, competent, and scientific; if housing and food are proper and adequate; if unnecessary mechanical restraints are employed; and if the hospital is modern in its care, custody, and treatment of the mentally disordered.

Another Federal Health Agency—In discussing 40 different branches of the federal government which are directly or indirectly interested in some phase of public health, it was thought that the 423 pages of the book, *The National Government and Public Health*, covered the field in a fairly thorough manner. Now we discover than one agency was omitted. According to the *Journal of the American Medical Association* for October 16, 1926 (page 1304), the Federal Trade Commission recently

issued a formal complaint against one Hobart Bosworth, declaring that this public benefactor (?), who manufactures a spine motion machine for health's sake, and his advertising agent "had unlawfully conspired and agreed together to deceive and defraud the public." The *Journal,* with its well known love for things chiropractic, comments in this pithy statement, "'Tis a hard world. If the Federal Trades Commission is going to insist on the truth in advertising, how is a hard working quack going to make a living?" The fact that the name of the government agency in question is Federal Trade (not "Trades") Commission does not detract from the justifiability of the comment, or interest in the fact that there are more federal agencies than we think on the trail of public health.

Miscellaneous Items—An order of the Rhode Island State Board of Purification of Waters to the Town of East Providence requiring the town to "adopt, use and operate some practical and reasonably available system or means to prevent sewage pollution of the Seekonk River" has been upheld by the Supreme Court of that state. The case is reported in 133 Atlantic 812. The order was valid under a statute and the case furthermore holds that neither towns nor individuals can acquire a prescriptive right to endanger public health by discharging sewage into public waters. This is a well established rule of law.

The Venereal Disease Manual recently issued by the United States Public Health Service has a brief chapter on the legal aspects of venereal disease control.

The question as to whose reports of communicable disease are to be accepted when two licensed doctors disagree is raised by the *Boston Medical and Surgical Journal* in an editorial, September 16. This has such an important legal aspect that we plan to discuss it in the next issue of the JOURNAL.

Another topic planned for future comment is the answer to the question often asked as to how to go about revising completely the health ordinances of a municipality. The associate editor is eager to receive suggestions for other subjects to be considered.

The *New York Medical Journal* has in its issue of November 1 a valuable article in its Legal Department on "The Art of Giving Testimony." This material was contributed by Lloyd Paul Stryker, counsel of the Medical Society of the State of New York. Dr. Frank Overton is editor of this progressive journal.

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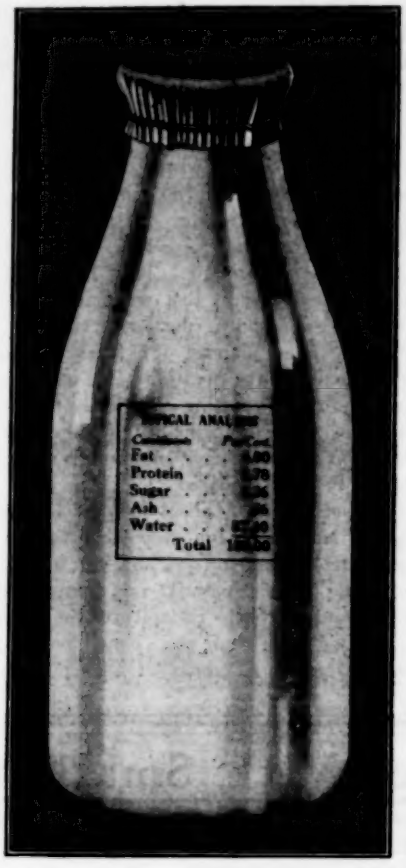

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Supplement to

AMERICAN JOURNAL OF PUBLIC HEALTH

JANUARY, 1926

Report of Committee on Municipal Health Department Practice

INCLUDING

Revised Appraisal Form for City Health Work

AMERICAN PUBLIC HEALTH ASSOCIATION

370 SEVENTH AVENUE, NEW YORK, CITY

MUNICIPAL HEALTH DEPARTMENT PRACTICE*

SINCE previous reports [1] made to the American Public Health Association have outlined in considerable detail the objectives and policies of the Committee on Municipal Health Department Practice, it need only be repeated here that its ideal is to realize the primary aim of the Association as a whole:

"The preparation, study, standardization and presentation of scientific public health procedures, by the collection of information in regard to current administrative health practice, the analysis of the material obtained to derive standards of organization and achievement and the translation of these standards into terms of concrete achievement through an information bureau and field service placed at the disposition of all members of the Association."

During the past year the committee at its own request was reorganized and enlarged so as to make it more fully representative of the practicing health officers of the country. As at present constituted the committee includes six city health officers, two state health officers, one representative of the United States Public Health Service, three professors of health administration and three representatives of voluntary agencies. The membership has a wide geographical distribution, representing eight states, the District of Columbia and the Dominion of Canada.

The funds for the support of the work of the committee during the first four years of its existence were generously contributed by the Metropolitan Life Insurance Company. During 1925, the cost has been borne equally by the Milbank Fund and the Metropolitan Life Insurance Company. Both of these organizations have consented to continue their aid to the committee during the coming year; but it is felt by all concerned that the work of the committee is in essence a primary, and indeed a fundamental, activity of the American Public Health Association itself and that the Association should next year begin to take a substantial share in its support, with a view to assuming, as soon as possible thereafter, complete financial responsibility for what is logically a bureau of its administrative office.

SURVEYS OF HEALTH PRACTICE

Three general surveys of municipal health practice in the United States have now been conducted; the first in 1921 (covering 83 cities of over 100,000 population) by the committee itself with the coöperation of the United States Public Health Service and other agencies;[2] the second in 1924 (of 100 cities of 70,000 population and over) by the United States Public Health Service; and the third, also in 1924 (of 86 cities between 40,000 and 70,000 population) by the American Child Health Association.[3] The United States Public Health Service has asked the Committee on Municipal Health Department Practice to take charge of the analysis for publication of the data collected in its 1924 survey; and the full report based on this study will appear during the coming winter. The report of the A.C.H.A. on the smaller cities has just been issued. The Committee does not plan in the immediate future to undertake on its own initiative any further comprehensive and detailed surveys of municipal health practice in

* Abstract of the Fifth Report of the Committee on Municipal Health Department Practice presented at the Fifth General Session of the American Public Health Association at the Fifty-fourth Annual Meeting, St. Louis, Mo., October 21, 1925. The balance of the report is incorporated in the introduction to the Appraisal Form which follows.

the cities of the country as a whole. It believes that this type of service, whose value has now been completely demonstrated, can most logically be carried on by the office of Administrative Health Practice, created in 1923, in the United States Public Health Service.

The committee will, of course, feel free to conduct surveys of individual cities when called upon to do so; and for this purpose is preparing a revised survey schedule suitable for such studies.

The committee feels that by the use of the Appraisal Form for City Health Work (to be discussed in a succeeding paragraph) it should be possible to secure from the city health officers themselves annual reports of the more significant phases of health department achievement, which could be analyzed and published promptly so as to furnish year by year a timely picture of current progress.

The committee has received urgent requests to undertake a comprehensive preliminary study of county health service like that which it initiated for city health departments in 1921. If the Association desires us to undertake this task, and if Surgeon-General Cumming's approval and coöperation can be secured, we shall be glad to do so. If, however, this enlargement in the scope of our labors is authorized, the name of the committee should be changed to Committee on Administrative Practice of the American Public Health Association, without the qualifying word " Municipal."

A second problem in the field of health practice which has been brought forcibly to our attention is the need for the most convenient and exact printed forms, to be used by health departments in the keeping of their records and in their dealings with the public. At the request of the Secretary of the Association a special sub-committee on Health Department Forms, including several coöpted members not members of the general committee, has been created to deal with this subject, and much valuable material in the files of the Association office has been placed at the disposal of this sub-committee.

A considerable portion of the time of the committee during the past year has been spent in considering and perfecting the Appraisal Form for City Health Work. The portion of the report dealing with the Appraisal Form and Survey Schedule, is to be reprinted for general distribution and has therefore been separately printed with the Appraisal Form itself at the end of this report.

In the field of standardization, as distinct from fact finding, the Appraisal Form represents in a sense a primary step. It indicates a general balance of activities and it measures actual service as indicated by typical items, susceptible of quantitative statement. Ultimately, however, it is felt that the work of the committee must logically and necessarily lead to the preparation of more detailed standards for appropriations, personnel, equipment, policies and procedures for each major division of the health department, in fact a picture of a model and well-balanced health department such as was attempted in the 1923 report, but on a much more extended scale. The three surveys now completed should make it possible to approach this task with greater success than has been possible before. With the aid of members coöpted from the sections representing the special fields concerned we plan to proceed as rapidly as possible with this important task.

FIELD SERVICE OF THE COMMITTEE

Finally, there remains for consideration what is perhaps the most important of all the functions of the committee, the bringing to the individual health officer of such direct aid in the conduct of his daily work as may be furnished by a properly organized field service. Our plan for this service received a heavy blow when early in 1925 Dr. W. S. Rankin, our Field Director, resigned to undertake the direction of the medical work of the newly organized Duke Foundation. On the first of May, how-

ever, we were fortunate in securing the services as Acting Field Director of Dr. C. St. Clair Drake, whose past administrative experience as Director of the Illinois State Health Department well fitted him for this task.

The outstanding items of the summer's work are as follows:

Twenty-seven cities were appraised on the basis of information gathered through personal visits.

Thirty-two cities were appraised from information secured from the survey, supplemented by information furnished by the local health officer.

One hundred survey schedules were prepared in duplicate. One copy was sent to the local health officer with the request for insertion of supplementary data. One was retained as a permanent office record.

The health officers of practically all the larger cities have been addressed twice by letter for the purpose of

a. Advising them of the aims, purpose and policies of the Committee.

b. Securing supplementary information for the appraisal.

Permission was received from 21 cities to use their local city graph on the cover design of a special city health number of the *Survey Graphic*.

Copies of the tentative appraisals of 37 cities have been made, preparatory to sending to the local health officer for correction and the supply of supplementary information.

Although the summer has been largely given over to the application of the appraisal form to specific cities, a service call was made to Manchester, New Hampshire, and invitations are at hand to visit Knoxville, Tenn., Toledo, O., Portland, Ore., Trenton, N. J., Waco, Houston, San Antonio, Dallas, and Fort Worth, Texas.

On September 8, Dr. W. F. Walker, who had long experience in health administrative methods as a member of the city health department of Detroit and who had in addition unusual experience in the survey and appraisal of cities as Research Associate of the American Child Health Association, was appointed Field Director, and will give his special attention to the cities of the eastern and central states. Dr. Drake, as Associate Director, will for the present work in the southern states and provision will be made as soon as resources permit for special service to the west coast. The field officers of the committee will be prepared to offer detailed information as to this or that administrative practice, such as the length of time to isolate a particular disease, the simplest office practice in filing reports of nuisance inspections, the exact status of the serum treatment of scarlet fever, the accepted ratio of staff nurses to supervisors; general counsel as to the development of a rounded and complete health program for their communities, counsel based on a knowledge of what is being done by other health officers throughout the country; and the effective support of an organized nation-wide professional opinion in securing needed appropriations or facilities from city authorities or in mobilizing public support for their policies.

As pointed out last year, "This Committee is your Committee, directly responsible to this Association of professional health workers. The upbuilding of the public health service of this country along the lines of sound and enlightened progress is primarily the problem of the professional public health workers themselves." It is to aid in the realization of such an ideal that the Committee on Municipal Health Department Practice stands ready to be of aid.

In view of the enlarged staff and facilities of the committee it will be possible during the coming year to offer to the health officers of the country a larger measure of consultative and advisory service than has heretofore been possible.

REFERENCES

1. *A. J. P. H.*, 12:7, 138, 1922; 13:588, 1923; 14:184, 1924; 15:39, 1925.
2. *Bulletin 136*, U.S.P.H.S., 1923.
3. *A Health Survey of 86 Cities.* Research Division of the American Child Health Association, 1925.

APPRAISAL FORM

FOR

CITY HEALTH WORK

COMMITTEE ON
ADMINISTRATIVE PRACTICE

AMERICAN PUBLIC HEALTH ASSOCIATION
370 SEVENTH AVENUE, NEW YORK CITY

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COMMITTEE ON
MUNICIPAL HEALTH DEPARTMENT PRACTICE

C.-E. A. WINSLOW, DR.P.H., *Chairman*

E. L. BISHOP, M.D.
CHARLES V. CHAPIN, M.D.
FRANCIS GEORGE CURTIS, M.D.
HAVEN EMERSON, M.D.
ALLEN W. FREEMAN, M.D.
CHARLES J. HASTINGS, M.D.
EUGENE R. KELLEY, M.D.*
A. J. LANZA, M.D.
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GEORGE C. RUHLAND, M.D.
LEWIS R. THOMPSON, M.D.
LOUIS I. DUBLIN, PH.D., *Secretary*

* Deceased.

NOTE: The name of this Committee was changed to COMMITTEE ON ADMINISTRATIVE PRACTICE, October, 1925.

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I. INTRODUCTORY STATEMENT[1]

The objectives and policies of the Committee on Municipal Health Department Practice are "the preparation, study, standardization and presentation of scientific public health procedures, by the collection of information in regard to current administrative health practice, the analysis of the material obtained to derive standards of organization and achievement and the translation of these standards into terms of concrete achievement through an information bureau and field service placed at the disposition of all members of the Association."

As at present constituted the committee includes six city health officers, two state health officers, one representative of the United States Public Health Service, three professors of health administration and three representatives of voluntary health agencies. Eight states, in addition to the District of Columbia and the Dominion of Canada, are represented in its membership.

Standardization of Health Practice

The major work of the committee during the past year has been devoted to the perfecting of the Appraisal Form for City Health Work, whose history was discussed at some length in the report of the committee a year ago.

The aim in mind has been to devise a brief Appraisal Form which would yield a reasonably accurate picture of the health services actually performed in a city as evidenced by certain typical sample activities. It was to be based not on money expended or personnel employed, which indicate resources rather than performance. Nor was it to be based on mortality rates, which are affected by so many racial and industrial factors as to make comparisons between various cities so frequently misleading. The idea was rather to measure the immediate results attained—such as statistics properly obtained and analyzed, vaccinations performed, infants in attendance at instructive clinics, physical defects of school children discovered and corrected, tuberculosis cases hospitalized, laboratory tests performed—with the confidence that such immediate results would inevitably lead on to the ultimate end of all public health work, the conservation of human life and efficiency.

The preparation of such an Appraisal Form involves, first of all, the selection of such typical activities in the various fields of health service as are susceptible of definite and quantitative measurement; secondly, the establishment of standard values for a maximum score, based on the actual performance of those cities which have attained outstanding results in the various fields in question; and, thirdly, the weighting of the various rated activities so as to give a reasonably clear picture of a balanced health program.

As stated in the committee's report of a year ago,[2] "We are convinced that an Appraisal Form, if it can be arrived at by the procedure here outlined, would prove of real value to the individual health officer in helping him to develop a balanced departmental program based upon relative values; to check up on the performance of his own bureaus and thus maintain the department at the highest point of efficiency; to defend himself when unjustly attacked, by showing that his department is organized in accord with the views of his professional colleagues;

[1] Extracted from the Fifth Report of the Committee on Municipal Health Department Practice. Presented at the Fifty-fourth Annual Meeting, St. Louis, Mo., at the Fifth General Session, October 21, 1925.

[2] *A. J. P. H.*, 15, 1:39, 1925.

to secure funds for expansion by indicating where his organization falls short of that generally accepted as ideal; and to secure the coöperation of local voluntary health organizations along the most effective lines."

The task of preparing an Appraisal Form, however, is one of the greatest difficulty and delicacy, and the committee has felt it necessary to proceed with the highest degree of caution in the task. As pointed out in the last report, the committee began its consideration of the Appraisal Form problem in the spring of 1923 when Dr. C. V. Chapin prepared the first draft of such a form for its consideration. In the fall and winter of 1923–24 Dr. W. S. Rankin, then Field Director of the committee, devoted himself with the greatest energy and enthusiasm to the development of the appraisal plan and brought into consultation in regard to it a large number of health officers and representatives of voluntary agencies. In particular, the American Child Health Association, in connection with its comparative studies of health work in 86 cities and in the planning of its subsequent field service with these cities, came to the same viewpoint held by the committee; that it would be desirable to express its findings in the form of a definite schedule of performance and values. After two separate Appraisal Forms, that of the Field Director and that of the American Child Health Association, had thus been independently formulated, it was realized by the representatives of both organizations that the two forms should, if possible, be reconciled and consolidated. In conference between representatives of the two organizations, which lasted well over a week, the two tentative forms of appraisal were reduced to one. Subsequently, representatives of several of the other large voluntary organizations, such as the National Tuberculosis Association, the American Social Hygiene Association, the National Organization for Public Health Nursing, and other members of the National Health Council, were invited to submit criticisms and suggestions.

Finally, in August, 1924, a committee of nine city health officers, representing groups of city health officials who had been enlisted in the active study of the Appraisal Form in Ohio and Michigan, and in New England, were called together in New York for a four-day conference, at which the Appraisal Form was again revised in a form later printed and issued by the American Public Health Association for experimental use for one year.

After these lengthy preliminary conferences, after one full year of trial use by a group of nearly fifty coöperating city health officers, and after the application of the Appraisal Form to the study of the data for 186 cities collected by the United States Public Health Service and the American Child Health Association surveys, a second general conference was held in New York in September, 1925, in which the Committee on Municipal Health Department Practice, the group of nine health officers representing coöperating officials in New England, Ohio and Michigan and the American Child Health Association, and other national voluntary health agencies, all took part. On the basis of recommendations made by this conference the committee has revised the Appraisal Form and believes that it is now sufficiently satisfactory to be issued with the approval of the committee as a basis for the appraisal of city health work.

This revised Appraisal Form will naturally require further revision in the future as knowledge advances and practices progress; but the committee believes that in its present form it should be given trial for a period of at least three years in order to secure data which shall have comparative value. The committee purposes to make a continuing study of the Appraisal Form by careful analysis of the scores actually obtained by the cities of the United States during the next year, by activities and items and in relation to budgets, personnel and disease rates, in

order to be in position, with the aid of other groups interested, to recommend whatever changes may be necessary in the form in 1928.

It is believed that the general utility of the Appraisal Form idea has been abundantly demonstrated by its first year of trial use. In a publication issued by the American Child Health Association there were reported the following specific uses, as demonstrated by its experience with the cities of 40,000–70,000 population; and our own field agents report similar reactions among the larger cities. The term "rating schedule" as used in the following quotation refers to the tentative Appraisal Form described above.

"As a brief for annual appropriations of the Department of Health. In several cities the rating schedule has been used to show in a comparative objective manner certain deficiencies in the department of health, and the expenditures which would be required to secure a full credit in place of these deficiencies. When presented in this manner to the appropriating body of the city, as a part of the health officer's budgetary request, the health department was, in one instance, the only department of the city government to receive an increase (amounting to 14 per cent) for the coming year. In another instance in the face of a strong movement for retrenchment throughout the city government, the health budget, presented in the light of the rating schedule, was the only departmental budget to remain uncut.

"As a basis for a Health Program. The value of the rating schedule as an outline of a well-balanced health program has appealed to several health officers to such an extent that their future programs are definitely based upon achieving the standards set in the schedule. * * *

"As a basis for an Annual Report. It has occurred to one health officer to incorporate in the annual report of his health department the detailed rating of his city, for the 83 items included in the schedule, and to publish the score attained, with full discussion of many of the items. Another health officer has largely improved the character of his annual report in the light of the Appraisal Form.

"As a means of interesting a Mayor or Chamber of Commerce. In a city which had recently scored itself the health officer was studying the rating when the mayor of the city happened to enter the office of the health department. Upon being shown the low rating of the city in diphtheria prevention the mayor inquired what could be done to improve the situation. When the health officer explained that he could secure a full score (30 points) if he had $175 with which to buy toxin-antitoxin, the mayor promised to make the sum available from special funds. Other health officers have taken the rating of their city to the mayor or the chamber of commerce and by comparing the local rating with that of other cities have awakened a new interest in the city's health record.

"As a means of arousing and cementing the interests of the Departments of Health and Education and of the private agencies in each other. A striking outgrowth of the use of the rating schedule in one city where the findings were reported in a special meeting, was the development of a new sense of the interdependence of all health agencies on each other and the formation of a joint health committee on which all agencies were represented under the leadership of the health officer. In another instance the rating schedule brought to the health officer for the first time the realization that he should coöperate with the department of education in its health work if his city was to secure the fullest return from its health activities. School medical inspection was promptly started."

Such evidence as this has materially strengthened the conviction that the Appraisal Form is likely to fill a large and important place in the history of public health development. On the other hand the committee realizes very fully the hazards involved in any such plan. In a problem so complex and so diversified as

public health administration, so materially affected by climatic and social factors, and in which the relationships between public and private agencies are so varied, no numerical appraisal plan can fail at times to yield an unscientific and inaccurate picture. If the Appraisal Form were to be used by outside lay agencies for the arbitrary comparative rating of cities, gross injustice might result. The primary safeguard of the scheme must lie, however, in its application. It has been prepared and issued by a committee representing the professional health workers of the country for the use of the municipal health officer in the self-appraisal of his work. The committee believes that there should be no appraisal of the health work of a city on this plan except with the approval of the health officers concerned; and that in no event should there be any publication of the appraisement of the health work of a city except with the consent of the health officers.

The committee has approved the official publication of an Appraisal Form only after long consideration and much discussion. Certain members of the committee seriously doubt the advisability at this time of setting up any formal standard of performance in health service. Certain others have felt that there is at present no adequate scientific basis for an attempt to formulate any numerical expression of the relative value of various health activities. A majority of the committee, however, have felt that the proven utility of the method more than outweighs its inherent inaccuracies and disadvantages, and have approved the schedule with the hope that in the next three years experience and study will permit the further perfection of the schedule and the establishment of methods of evaluation which will obviate the objections which have been offered to the present plan.

GENERAL DIRECTIONS

In revising the Appraisal Form it has seemed advisable to combine with it a suitable survey schedule for gathering in orderly array the essential data necessary to an appraisal of city health work. The items of general interest, such as population, health personnel, finances, birth, death and specific rates, have been placed in a few pages under the heading "Supplementary Information." The schedule for collecting detailed data required for the appraisal has been routinely placed on the left-hand page, opposite the corresponding item in the Appraisal Form. In this way there is first gained a general picture of the city, then a more detailed presentation of public health practices which we may compare with the standard set up in the Appraisal Form.

It is important that the system of appraising health work should be simple enough and clear enough to be susceptible of use by health officers throughout the country without the necessity of personal conference with those who have assisted in devising the Appraisal Form and without further directions than those that follow. Such use necessitates a statement of exact meanings intended by the terms of the schedule, including directions for scoring and grading each item; otherwise there would occur unnecessary variations in credits given the same item of service by different appraisers. It is essential that health officers who wish to appraise their local health work at least for the first time should read the directions for evaluating each service before proceeding to do so. The Appraisal Form is intended for the appraisal of all city health work, that performed by official agencies, city and state, and that performed by unofficial agencies as well. For this reason, throughout the survey schedule place is provided for the recording of work done by the Health Department, Other Official Agencies, and by Voluntary Agencies. Likewise, throughout the Appraisal Form in the space provided for grading, four columns are arranged with the headings "H.D.," "O.O.A.," "V.A.," and "Total." Here the proportion of grading due these various groups is to be recorded. In this way it is possible to show for any activity the proportion of the total score contributed by official or by voluntary agencies.

Where questions call for records of work it is intended that the figures *for the last year of record* shall be given unless otherwise specified.

In crediting the various items of service with the points of value assigned it is understood that the appraiser is to apportion the credits assuming the uniform rate of increase from zero up to the maximum, modifying this plan only where for the appraisal of an item there is specifically stated a graduated scale of credits.

Two new terms are introduced into the Appraisal Form through the past year's experience, namely, "Quota" and "Performance." Quota is defined to mean the volume of service required if a city is to receive full credit. Performance is defined to mean the volume of service actually performed in the city. Wherever credit is given on a service which is numerically expressed, such as the number of nursing visits, the number of cases reported, or the number of patients attending clinic, a space has been provided entitled "Quota." In this space it is expected that the user of the Appraisal Form will record the volume of service which the city should have if it is entitled to a full score. For example: It is expected that 10 cases of typhoid fever would be reported for every death. If the city has 8 deaths its "Quota" of reported deaths is 80. In infant welfare service it is expected that there will be 4,000 nursing visits per 1,000 live births. If a city has

2,500 live births annually its "Quota" of nursing service for infants is 2.5 x 4,000, or 10,000 nursing visits. The calculation of credit then is as follows: The "Performance," which is obtained from the survey schedule on the left-hand page, for any activity is divided by the "Quota" and multiplied by the "Value" of the item to obtain the credit. A specific example is given where it is first used under item 6, Reporting of Communicable Diseases.

"Nurses' Visits," as used in items of service, refers to and may include any, or all, of the types of service which a nurse may perform in behalf of a patient outside the clinic or her office, such as: (1) Observation and investigation; (2) Visits of instruction and demonstration; (3) Visits where bedside nursing is performed; and (4) Visits of a social service nature which are necessary in behalf of a case.

Except where otherwise directed, the information for crediting an item is to be obtained from the records of the department or agency or by ascertaining its practices.

It will undoubtedly be apparent to the student of this Appraisal Form that some activities with definite health significance have been omitted from consideration. This has been fully recognized, but it has been thought advisable owing to the desirability of not unduly complicating the Form, and because certain activities cannot be satisfactorily measured by objective standards. Having this difficulty in mind the committee has formally authorized the Field Director to credit new methods or services accomplished other than as specifically provided in the Appraisal Form when the same end is achieved. For example: If a city is able to show by statistical record that a large proportion of all its mothers receive adequate prenatal supervision through their family physicians, that city should receive credit equal to that allowed for the maintenance of a prenatal clinic. Similar examples may be found in practically every section and it is desired to give due recognition to these definite advances and to encourage development. It is hoped, therefore, that in those instances where particularly effective work is being conducted along health lines not fully covered in the Appraisal Form that such information will be fully recorded. In so doing, information will be secured which may improve the standing of a city and may prove valuable in considering further revision of the Form.

II. SUPPLEMENTARY INFORMATION

City..... State.....

For the year.....

Gathered by

.....

.....

Date surveyed.....

Mayor..... Health Officer.....

A. POPULATION

NOTE: Unless otherwise specified the information called for should be for the last year for which records are available. If otherwise, the fact should be noted.

U. S. Census 1920.....

U. S. Census estimate current year (192.....).....

Local estimate.....

Classification of Population

Per cent Native White.....

Per cent Colored.....

Per cent Foreign Born.....

B. BIRTHS, DEATHS AND RATES

For Year 192.....

Birth rate.....

Death rate.....

Stillbirths.....

Infant mortality rate current year.....

Combined puerperal deaths[1].....

Deaths, diarrhea and enteritis under 2 years.....

Deaths, measles.....

Deaths, whooping-cough.....

Deaths, diphtheria.....

Deaths, typhoid fever.....

Deaths, tuberculosis of lungs.....

[1] This item refers to the deaths from causes 143 to 150 inclusive, of the International Classification of Causes of Deaths, 1920 revision.

Total births [1] (still....., live.....).....

Total deaths [2].....

Deaths of infants under 1 year.....

Deaths of infants under 1 month.....

Infant mortality rate 5 preceding years:

192.... ..... 192.... ..... 192.... .....

192.... ..... 192.... .....

[1] Where figures are available which make possible the exclusion of births within the city to non-resident mothers and the inclusion of births outside the city to resident mothers, this correction should be made, but not for either one of these alone.

[2] Corrections should be made, if possible, for residents dying away from the city and non-resident deaths, but not for either one of these alone.

C. FINANCES

Total assessed value of property:[3] Real.....

Personal.....

Approximate ratio of assessment to true value.....

Tax rate per $1,000 assessed value.....

Expenditures: Interest and redemption .....

General government.....

Schools.....

Highways.....

Police.....

Fire protection.....

Hospitals.....

Charity.....

Cleanliness and sanitation.....

Recreation.....

Health.....

D. RECENT CHANGES IN CITY GOVERNMENT

Record any changes in the city government in the last 5 years:

General Administration.....

Organization of the Health Department.....

.....

Appointment of the Health Officer.....

.....

Qualification of Health Officer.....

Powers and duties of Health Officer.....

.....

[3] If this information is not readily available locally it may be obtained from the Financial Statistics of Cities, Bureau of the Census, Department of Commerce.

E. HEALTH ACTIVITIES

Name of Agency and Person in Charge of Following Specific Activities

Activities	Organization	Person in Charge
Vital statistics		
Communicable disease control		
Antitoxin and immunizing agents		
Contagious disease hospital		
Venereal clinics		
Tuberculosis clinics		
Tuberculosis hospitals and sanatoria		
Prenatal service		
Midwives, supervision of		
Infant welfare work		
Preschool child hygiene		
School medical inspection		
Dental clinics		
Orthopedic clinics		
Mental clinics		
Nursing: Maternity		
Child Hygiene		
Communicable diseases		
Tuberculosis		
Bedside care		
School		
Other		
Food and milk control		
Housing		
Nuisance inspection		
Swimming pools		
Health prosecutions		
Public comfort stations		
Plumbing		
Garbage collection		
Public scavenger		
Street cleaning		
Water supply control		
Laboratory		

F. EXPENDITURES FOR HEALTH

Total annual appropriation of the department of health past 5 years . . . . . 192..... .....

192..... ..... 192..... .....

192..... ..... 192..... .....

Unexpended balance for last year . . . .

Classification of Official Expenditure

(Wherever possible, classify expenditures by Activities as indicated; otherwise classify by existing administrative allotments.)

Activity or Bureau	Department in Charge	Amount Expended	Per Capita Cost
Administration			
Education and Publicity			
Vital Statistics			
Communicable Disease Control [1]			
Venereal Disease Control [1] . .			
Tuberculosis Control [1]			
Maternity Hygiene [1]			
Infant Hygiene [1]			
Preschool Hygiene [1]			
School Hygiene [2]			
Mental Hygiene			
Public Health Nursing [3]			
Milk Control			
Other Foodstuffs Control . . .			
Public Health Laboratory . . .			
General Sanitation and Housing [4]			
Hospital: General			
Communicable Dis. .			
Venereal Disease . .			
Tuberculosis			
Smallpox, only . . .			
Mosquito Eradication			
Rodent Control			
Industrial Hygiene			
.....	.....	.....	.....
.....	.....	.....	.....
	Total		

[1] Indicate by "I" or "X" whether or not the cost of field nursing service in these activities is included or excluded, respectively.

[2] To include medical, dental, nursing supervision, and treatment. Not to include physical education, health education or cost of special classes.

[3] Record only that service not included in other classifications.

[4] Star if plumbing is included.

Classification of Non-Official Expenditures for Health

Private Agencies doing Health Work	Activity	Amount Expended	Per Capita Cost
	Total		

G. HEALTH PERSONNEL IN COMMUNITY

Classification of Health Personnel in Community

	Personnel	Administration		Vital Statistics		Communicable Diseases		Venereal Diseases		Tuberculosis	
		Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time
Department of Health	Director										
	Cl. Physicians										
	Other Medical Personnel										
	Dentists										
	Nurses										
	Inspectors										
	Veterinarians										
	Dental Hygienists										
	Technicians[1]										
	Others										
Dept. of Education	Director										
	Cl. Physicians										
	Dentists										
	Nurses										
	Dental Hygienists										
Visiting Nurses Assn.	Director										
	Cl. Physicians										
	Sup. Nurses										
	Field Nurses										
	Clerks										
Other[2] Agencies	Director										
	Cl. Physicians										
	Dentists										
	Nurses										
	Inspectors										
	Clerks										
Other Agencies	Director										
	Cl. Physicians										
	Dentists										
	Nurses										
	Inspectors										
	Clerks										

[1] The term "Technician" includes all laboratory workers except directors.

[2] Use first box for next most important agency and second for all others.

Prenatal		Int. and Preschool		School Health		Sanitation		Food and Milk		Laboratory		Other		TOTAL	
Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	Full Time

III. SURVEY SCHEDULE FOR CERTAIN TYPICAL ACTIVITIES COMMON TO CITY HEALTH WORK

A. VITAL STATISTICS

1. **Registration**

   a. Is city in Registration Area for Deaths? .....

   b. Is city in Registration Area for Births? .....

2. **Checking and Verification**

   a. Are certificates, before being accepted for filing, examined and corrected for errors, inconsistencies and omissions?

   Births .....

   Deaths .....

   b. Is it routine practice to check and reconcile deaths with reported cases of the following diseases?

   Tuberculosis ..... Typhoid .....

   Diphtheria ..... Scarlet Fever .....

   Measles ..... Whooping Cough .....

   c. Is it routine practice to check deaths under one year ..... and stillbirths ..... against certificates of birth and stillbirth?

3. **Indexing**

   a. Are deaths indexed? ..... How? .....

   b. Are births indexed? ..... How? .....

III. AN APPRAISAL FORM FOR CERTAIN TYPICAL ACTIVITIES COMMON TO CITY HEALTH WORK

A. VITAL STATISTICS (Total Points 60)

	Value of Item	Value Assigned HD	OOA	VA	Total
1. Registration (8)					
a. City in Registration Area for Deaths	4				
b. City in Registration Area for Births	4				
2. Checking and Verification (16)					
a. Certificates checked for completeness, and reconciled	4				
i. Births 2					
ii. Deaths 2					
b. Death certificates from communicable diseases (tuberculosis, typhoid, diphtheria, scarlet fever, measles, whooping cough) routinely checked against disease reports and reconciled	6				
c. Deaths under one year and stillbirths checked against reported births and stillbirths . . .	6				
3. Indexing (4)					
a. Deaths indexed alphabetically by name . . .	2				
b. Births indexed alphabetically by name	2				

NOTE: HD, OOA and VA signify Health Department, Other Official Agencies, and Voluntary Agencies, Record value assigned for each item under appropriate heading indicating the agency responsible for that service. Where a service is the result of effort by no particular agency but of the community as a whole, such as the inclusion in the Registration Area, enter the score under the heading "Total." Where several agencies are engaged in the activity, apportion the score as nearly as possible to the agencies involved. In no case can credit be assigned greater than that given the item.

4. **Classification and Compilation**

a. Are all deaths classified by either the complete or abridged International Classification of Causes of Death and a tabulation of the number of deaths in each class made annually? .....

b. Is there an annual tabulation of deaths?

By age .....

By sex .....

c. Is there an annual tabulation of deaths?

By color .....

By nativity .....

d. Is there an annual tabulation of deaths under one year?

By color .....

By nativity of mother .....

e. Is there an annual tabulation of births?

By color .....

By nativity of mother .....

f. Is the infant mortality rate computed annually for these groups?

Children of:

Native born white mothers .....

Foreign born white mothers .....

Colored mothers .....

g. Are death rates of each of the 10 locally principal causes of death computed annually? .....

h. Is there monthly tabulation of deaths by cause? .....

4. Classification and Compilation (24)	Value of Item	Value Assigned HD	OOA	VA	Total
a. Annual tabulation of deaths by cause	4				
b. Annual tabulation of deaths by age and sex [1] . .	2				
c. Annual tabulation of deaths by color [2] and nativity	2				
d. Annual tabulation of deaths under one year by color and nativity of mother	2				
e. Annual tabulation of births by color and nativity of mother	2				
f. Annual infant mortality rate by nativity and color of mother	2				
g. Annual death rates of each of the 10 locally principal causes of death	4				
h. Monthly tabulation of deaths by cause	6				

[1] If tabulation is made of either item of *b*, *c*, *d*, *e*, *f*, alone, score one point.

[2] If the proportion of colored population is but 5 per cent or less or the foreign born is but 10 per cent or less of the total population, tabulations by nativity or color are not required to be made and credit will be allowed on these items providing full credit is obtained on *a*, *b* and *h*.

5. **Interpretation and Application**

a. Are the certificates of births and deaths for the past 10 years bound and filed in a manner which will preserve them yet render them readily accessible for reference?

Births .....

Deaths .....

b. Graphic charts:

i. Are the death rates from locally important causes plotted graphically? .....

What diseases? .....

For how many years? .....

ii. Is the infant mortality rate shown graphically? .....

For how many years? .....

c. Is there a printed annual statistical report available showing?

Cases of communicable diseases .....

Deaths from communicable diseases .....

Infant mortality rates .....

Births ..... Stillbirths .....

Deaths by age periods .....

Does report contain interpretive comment? .....

5. Interpretation and Application (8)	*Value of Item*	*Value Assigned* HD	OOA	VA	*Total*
a. Certificates of preceding years bound and filed in accessible form	2				
b. Graphic charts available and up to date, showing	2				
i. Death rates from important causes for 3 or more years, 1 point.					
ii. Infant mortality rates for 3 or more years, 1 point.					
c. Previous year's statistical report in tabular form and with interpretive comment printed in an annual report . . . . . (If available only as newspaper clipping, score 1).	4				

B. COMMUNICABLE DISEASE CONTROL

6. Reporting

Number of deaths and cases last year from the diseases listed:

	Total Deaths	Total Cases Reported
Typhoid and paratyphoid	.....	.....
Diphtheria	.....	.....
Scarlet fever	.....	.....
Measles	.....	.....
Whooping-cough . . .	.....	.....

NOTE: Cases reported by telephone shall, for the purpose of this item, be considered officially reported.

7. Record Keeping

a. Are individual epidemiological case histories made of each of the following diseases?

Typhoid ..... Diphtheria .....

Scarlet Fever ..... Poliomyelitis .....

i. Are the essential facts in these case histories filed in a ledger? ..... or card-file? .....

giving name and address of the patient? .....

and date of report? .....

ii. Are the essential facts concerning each case of these diseases correlated with other epidemiological information such as:

Milk? ..... Water? ..... School? .....

Contact with cases? ..... Other? .....

[3] This item presupposes the existence of an epidemiological case record of diseases as listed, the essential data of which shall be filed as in i. or ii.

For subdivision i. the score would be 6; for subdivision ii. the score would be 10. The total score for item "a" of *Record Keeping,* must be one of three scores, 0, 6 or 10.

B. COMMUNICABLE DISEASE CONTROL (Total Points 175)	Value of Item	Value Assigned HD	OOA	VA	Total
6. Reporting (18)[1]					
a. Typhoid and paratyphoid	4				
Standard: 10 cases per death					
Cases 10 . . . 4 *Points*[2]					
0 . . . 0					
Quota					
b. Diphtheria	4				
Standard: 15 cases per death					
Cases 15 . . . 4 *Points*					
0 . . . 0					
Quota					
c. Scarlet Fever	4				
Standard: 50 cases per death					
Cases 50 . . . 4 *Points*					
0 . . . 0					
Quota					
d. Measles	3				
Standard: 100 cases per death					
Cases 100 . . . 3 *Points*					
0 . . . 0					
Quota					
e. Whooping-cough	3				
Standard: 25 cases per death					
Cases 25 . . . 3 *Points*					
0 . . . 0					
Quota					

[1] This item refers to the cases per death from the diseases named. Where there are no deaths or only 1 death during the year, give full credit, regardless of cases.

[2] Example of Computation of Credit:

Quota is defined to mean the volume of service required if a city is to receive full credit.

Performance is defined to mean the volume of service actually performed in a city.

Assume a city has 60 cases and 8 deaths of typhoid fever, 60 cases is its typhoid reporting *Performance.*

Its *Quota* on the standard of 10 cases per death would be 80. The credit is then calculated by dividing the *Performance* by the *Quota* and multiplying by the *Value.*

$$\frac{\text{Performance}}{\text{Quota}} \times \text{Value} = \text{Credit} \qquad \frac{60}{80} \times 4 = 3 \text{ credit}$$

7. **Record Keeping (22)**					
a. Filing of case records by[3]					
i. Ledger or card-file of diseases by disease, score 6 points, or					
ii. Card-file with disease incidence correlated with other epidemiological information, such as milk dealers, schools, etc., score 10 points.					
Maximum score	10				

7. (*Record Keeping continued*)

b. Are spot maps routinely kept of cases of these diseases?

Scarlet Fever .....

Typhoid Fever .....

Diphtheria .....

NOTE: It is not necessary that there be 3 separate maps, a single map showing the different diseases by suitable symbols is sufficient.

c. Are chronological charts kept showing the prevalence of the following diseases by weeks?

Scarlet Fever ..... Diphtheria .....

Any 2 other diseases which the health officer selects? .....

CONTROL PRACTICES

8. **Diphtheria Control**

a. Are all immediate family contacts of cases of diphtheria cultured? .....

Note exceptions .....

Are contacts with positive cultures held in isolation until cultures are shown to be negative or avirulent? .....

Note exceptions .....

b. What per cent of susceptible contacts to diphtheria last year were immunized, passively or actively, either by health department or private physician? .....

NOTE: All children under 15 years shall be considered susceptible unless they are known to be Schick negative.

c. Are any diphtheria cases released without culture? .....

Are diphtheria cases released after a time limit quarantine established by legal authority and one negative culture each from nose and throat of patient? .....

Are diphtheria cases released from quarantine only after 2 successive negative cultures from nose and throat taken at least 24 hours apart? .....

7. (*Record Keeping continued*)	*Value of Item*	*Value Assigned* HD	OOA	VA	*Total*
b. Spot map of cases of typhoid fever, scarlet fever and diphtheria	6				
c. Chronological charts of cases	6				
i. Scarlet Fever	2				
ii. Diphtheria	2				
iii. Any other two diseases	2				
CONTROL PRACTICES (95)					
8. **Diphtheria Control (14)**					
a. All known (immediate family) contacts cultured and controlled	2				
b. Fifty per cent of all susceptible contacts either passively or actively immunized	2				
c. Cases released on cultures	2				

8. (*Diphtheria Control continued*)

d. Are there facilities present for making virulence tests of positive diphtheria cultures of long standing? .....

In what per cent of cases showing positive cultures of more than 6 weeks' duration was the virulence test used last year? .....

e. Is antitoxin distributed free to physicians by the city? .....

By the state? .....

Is toxin-antitoxin distributed free to physicians? .....

For curative purposes or for passive immunization of any case or person? .....

Or is it distributed free only for those cases which are not able to pay? .....

9. **Typhoid Control**

Is it routine practice to require negative cultures both from the stool and urine of typhoid patients before they are released from isolation? .....

How many negative cultures are required and at what intervals? .....

10. **Smallpox Control**

Are all susceptible contacts to smallpox vaccinated? .....

If not, are they kept under observation and efficiently controlled? .....

How long? .....

11. **Scarlet Fever Control**

Are children who are contacts to cases of scarlet fever quarantined? .....

If so, under what restrictions? .....

How long? .....

8. (*Diphtheria Control continued*)	*Value of Item*	*Value Assigned* HD	OOA	VA	*Total*
d. Use of virulence tests	2				
e. Free distribution of antitoxin to physicians for any case or contact	6				
9. **Typhoid Control**					
All cases released from isolation only after negative cultures	3				
10. **Smallpox Control**					
All known susceptible contacts successfully vaccinated or effectively controlled for 21 days . . .	5				
11. **Scarlet Fever Control**					
Child contacts effectively controlled for 7 days . .	5				

12. **Ophthalmia Control**

Are cases of ophthalmia neonatorum reported to the health department?.....
Are the following services specifically provided for the care of such cases?

a. Medical .....

b. Nursing .....

c. Hospitalization with special nursing service? .....

By whom is such service provided? .....

How many reported last year? .....

How many given free treatment? .....

13. **Visits to Cases**

Total number of visits [1] made last year by health department officials to each of the 7 diseases listed:

	No. of Cases	No. of Visits
a. Diphtheria	.....	.....
b. Typhoid	.....	.....
c. Scarlet Fever	.....	.....
d. Poliomyelitis	.....	.....
e. C. S. Meningitis . . .	.....	.....
f. Measles	.....	.....
g. Whooping-Cough . . .	.....	.....

[1] It is understood that the term "visits" as herein used, refers to the visits of professional personnel (physicians and nurses) who are qualified to instruct the family with reference to concurrent disinfection, the care of the patient and the protection of the public, and that it should not be interpreted to refer to visits by non-professional personnel, that is, inspectors and police.

12. **Ophthalmia Control**	*Value of Item*	*Value Assigned* HD	OOA	VA	*Total*
Prompt reporting and provisions for immediate and adequate treatment	5				
13. **Visits to Cases (26)**[1]					
a. Diphtheria	4				
Standard: 4 visits per case					
Visits 4 . . . 4 *Points*					
0 . . . 0					
Quota.....					
b. Scarlet Fever	4				
Standard: 4 visits per case					
Visits 4 . . . 4 *Points*					
0 . . . 0					
Quota.....					
c. Typhoid	4				
Standard: 4 visits per case					
Visits 4 . . . 4 *Points*					
0 . . . 0					
Quota.....					
d. Poliomyelitis	4				
Standard: 4 visits per case					
Visits 4 . . . 4 *Points*					
0 . . . 0					
Quota.....					
e. C. S. Meningitis	4				
Standard: 4 visits per case					
Visits 4 . . . 4 *Points*					
0 . . . 0					
Quota.....					
f. Measles	3				
Standard: 2 visits per case					
Visits 2 . . . 3 *Points*					
0 . . . 0					
Quota.....					
g. Whooping-cough	3				
Standard: 2 visits per case					
Visits 2 . . . 3 *Points*					
0 . . . 0					
Quota.....					

[1] For the purpose of this item the number of cases of a disease shall be interpreted to mean those cases cared for in the home (or total number of cases less the number cared for in hospitals).

If no case of a particular disease is reported for a given year, total score for this disease should be prorated over the other items.

14. **Diagnostic Service**

Does the health department maintain a consulting diagnostic service for assisting physicians in difficult diagnoses or for relieving the members of the medical profession of embarrassing responsibilities in doubtful cases? .....

Number of consulting calls made last year .....

15. **Hospitalization**

How many cases of the following diseases were hospitalized last year?

	No. of Cases Reported	No. of Cases Hospitalized
a. Typhoid	.....	.....
b. Diphtheria	.....	.....
c. Scarlet Fever	.....	.....
d. Smallpox	.....	.....

14. Diagnostic Service	Value of Item	Value Assigned HD	OOA	VA	Total
Consulting diagnostic service for use by physicians .	5				
Standard: 50 calls per 100,000 population					
Calls 50 . . . 5 *Points*					
0 . . . 0					
Quota.....					
15. **Hospitalization (32)**					
a. Typhoid	8				
Standard: 40 per cent of cases hospitalized					
Per cent 40 . . . 8 *Points*					
0 . . . 0					
Quota.....					
b. Diphtheria	8				
Standard: 25 per cent of cases hospitalized					
Per cent 25 . . . 8 *Points*					
0 . . . 0					
Quota.....					
c. Scarlet Fever	8				
Standard: 25 per cent of cases hospitalized					
Per cent 25 . . . 8 *Points*					
0 . . . 0					
Quota.....					
d. Smallpox [1]	8				
Standard: 75 per cent of cases hospitalized					
Per cent 75 . . . 8 *Points*					
0 . . . 0					
Quota.....					

[1] If no case of smallpox occurred during the past year but hospital facilities were available, full score should be given.

16. Immunization

a. Diphtheria:

i. Total number of children, ages 1 to 4, inclusive, recorded by the health department actively immunized against diphtheria by the use of toxin-antitoxin last year .....

Estimated population, ages 1 to 4, inclusive [1] .....

[1] This figure may be estimated as 8.8 per cent of the total population or may be obtained from the chapter on Age Distribution, Vol. II of the Fourteenth Census, and adjusted on this basis.

ii. Total number of children over 5 years of age recorded by the health department as actively immunized against diphtheria by the use of toxin-antitoxin last year [2] .....

Total grade school population .....

[2] Those shown by the Schick test to be possessed of active immunity shall for the purpose of reporting these items be considered as having been immunized.

b. Smallpox:

Is vaccination of school children compulsory? .....

Per cent of the children of the first grade vaccinated .....

Total number of persons recorded by the health department as newly vaccinated last year .....

NOTE: If percentage of vaccination is known for a grade other than the first, those figures may be used.

16. **Immunization (40)**	*Value of Item*	*Value Assigned* HD	OOA	VA	*Total*
a. Diphtheria	30				
i. Immunization of preschool children last year, ages 1 to 4, inclusive, score 20					
Standard: 25 per cent of preschool population [1]					
Per cent 25 . . . 20 *Points*					
0 . . . 0					
Quota.....					
ii. Immunization of grade school children last year, score 10					
Standard: 10 per cent of grade school population					
Per cent 10 . . . 10 *Points*					
0 . . . 0					
Quota.....					
b. Smallpox:					
Per cent vaccinated against smallpox	10				
Standard: 95 per cent of first grade school children, or 3 per cent annually of total population					
Per cent, first grade:					
95 . . . 10 *Points*					
70 . . . 0					
Quota.....					
Per cent, total population:					
3 . . . 10 *Points*					
0 . . . 0					
Quota.....					

[1] The standard of 25 per cent of the preschool population immunized against diphtheria annually is set up because the new crop of susceptibles entering the preschool period, years 1 to 4 inclusive, is roughly one-quarter of the total population of that period.

If a city scores full credit on the first item and immunization has been carried on to a similar extent for 3 consecutive years, though no immunization of the grade school population was carried on last year full credit of 30 points should be given. It will be noted that where there is systematic immunization in the early years, those of greater susceptibility, additional credit is given.

C. VENEREAL DISEASE CONTROL

17. Reporting

Are cases of venereal disease (syphilis, gonorrhea, chancroid) reported either to city? .....

Or state? .....

Are cases reported by: Name and address? .....

Office number? .....

Number of cases thus reported for 3 years:

	192.....	192.....	192.....
Syphilis	.....	.....	.....
Gonorrhea	.....	.....	.....
Chancroid	.....	.....	.....
Total	.....	.....	.....

18. Clinical Service

Venereal Disease Service Last Year, 192.....

By Whom Operated	Number Clinics per Week	Total Clinic Registration	New Cases		No. Visits			No. Treatments		
			Adult	Children	Gonorrhea	Syphilis	Chancroid	Gonorrhea	Syphilis	Chancroid

NOTE: Registration is defined to mean the number of persons who were in active attendance at the clinic for either diagnosis or treatment. Clinic visits is defined to mean visits made for either diagnosis or treatment.

Number of evening clinics per week .....

19. Cases Returned to Physicians or Clinics

Number of cases of venereal disease reported by physician or clinic as having discontinued treatment before being rendered non-infectious

.....

.....

Number of such cases subsequently returned to either clinic or private physician for completion of treatment .....

C. VENEREAL DISEASE CONTROL (Total Points 50)

	Value of Item	Value Assigned HD	OOA	VA	Total
17. **Reporting**	12				
Standard: 400 cases per 100,000 population					
Cases 400 . . . 12 *Points*					
0 . . . 0					
Quota.....					
18. **Clinical Service (30)**					
a. Clinic Registration	10				
Standard: 800 registrants per 100,000 population					
Registrants 800 . . . 10 *Points*					
0 . . . 0					
Quota.....					
b. Clinic Visits	20				
Standard: 10 visits per new patient registered					
Visits 10 . . . 20 *Points*					
0 . . . 0					
Quota.....					
19. **Cases Returned to Physicians or Clinics**					
Per cent of cases returned to physicians or clinics after having stopped treatment	8				
Standard: 60 per cent of discontinued cases returned					
Per cent 60 . . . 8 *Points*					
0 . . . 0					
Quota.....					

D. TUBERCULOSIS CONTROL

20. Reporting

Number of tuberculosis cases reported for 3 years:

	192.....	192.....	192.....
a. Total new cases reported:			
Pulmonary	.....	.....	.....
All Forms	.....	.....	.....
b. Total active cases on register:			
Pulmonary	.....	.....	.....
All Forms	.....	.....	.....
c. Total Deaths			
Pulmonary	.....	.....	.....
All Forms	.....	.....	.....

NOTE: Correction should be made, if possible, for residents dying away from the city and for non-resident deaths and cases, but not for either one of these alone. Suspicious and arrested cases should not be counted under *b*.

21. Field Nursing Service

a. Number of nurses' visits [1] to tuberculous cases by:

	No. Cases	No. Visits
Health Department	.....	.....
Other Official Agencies	.....	.....
Voluntary Agencies	.....	.....

[1] This item is defined to mean the number of nurses' visits, as defined in the "General Directions," in behalf of tuberculous patients or persons under supervision because of previous or present contact with tuberculosis. This item does not include visits of nurses to open-air schools or preventoria.

b. Number of nurses' visits in behalf of tuberculous patients as a follow-up of sanatorium care by:

Health Department	.....
Other Official Agencies	.....
Voluntary Agencies	.....

D. TUBERCULOSIS CONTROL (Total Points 100)

	Value of Item	Value Assigned HD	OOA	VA	Total
20. **Reporting**	10				

Standard: 2 new cases (of all forms) reported last year per death last year

Cases		*Points*
2	. . .	10
1	. . .	5
0	. . .	0

Quota.....

Fractional ratios may be prorated.

21. **Field Nursing Service (25)**

a. Number of visits by nurses in behalf of tuberculous cases 20

Standard: 5,000 visits per 100 deaths

Visits		*Points*
5,000	. . .	20
0	. . .	0

Quota.....

b. Follow-up of post-sanatoria cases 5

Standard: 20 per cent of total tuberculosis field nursing visits made in behalf of post-sanatoria cases

Per cent		*Points*
20	. . .	5
0	. . .	0

Quota.....

22. Clinical Service

a. Total number of visits for either diagnosis or treatment of tuberculosis made last year to clinics of:

Health Department .....

Other Official Agencies .....

Voluntary Agencies .....

b. Total number individual patients registered at clinic either for diagnosis or treatment within the last 12 months:[1]

Health Department .....

Other Official Agencies .....

Voluntary Agencies .....

[1] Chronic cases carried upon the active file of the clinic but who have not actually been at the clinic during the past year should not be included.

Total number of new patients registered for either diagnosis or treatment at clinics of:

Health Department .....

Other Official Agencies .....

Voluntary Agencies .....

23. Hospitalization

Data on Hospitalization of Tuberculosis Cases Last Year

Name of Institution[2]	Primarily designed for [3]	Number beds city cases		Total Beds	Total No. Admissions	Per cent classed on admission as			Total patient days	Average length stay	Av. cost per patient per day
		Adults	Children			Inc.[4]	Mod. Adv.	Far Adv			
I											
II											
III											
IV											

Note: [2] Insert name of institution:

I. ..... III. .....

II. ..... IV. .....

[3] Indicate whether institution was designed primarily for Inc., Mod. Adv., Far Adv. Cases.

[4] Incipient cases are defined to mean those which upon admission to the hospital have not passed the incipient stage of the disease.

24. Open-Air Classrooms, Preventoria or Day Camps

	No. Classes, etc.	No. in Attendance	Mid-day Meal	Rest Period	Average Length of Stay
Open-Air Classrooms	.....	.....	.....	.....	.....
Preventoria	.....	.....	.....	.....	.....
Day Camps	.....	.....	.....	.....	.....

	Value of Item	Value Assigned HD	OOA	VA	Total
22. Clinical Service (25)					
a. Number of Clinic Visits	15				
Standard: 3,000 visits per 100 deaths					
Visits 3,000 . . . 15 *Points*					
0 . . . 0					
Quota.....					
b. Ratio total clinic visits to number of individual patients attending last year	10				
Standard: 3 visits per patient registered					
Visits 3 . . . 10 *Points*					
0 . . . 0					
Quota.....					
23. Hospitalization (25)					
a. Patient days [1]	15				
Standard: 25,000 patient days per 100 deaths					
Patient Days 25,000 . . . 15 *Points*					
0 . . . 0					
Quota.....					
[1] This item is defined to mean the total number of patient days of hospital care for residents per 100 deaths and applies whether the hospital be owned by the state, county or municipality, and to private hospital care, regardless of whether the care is given at public or private expense.					
b. Per cent of incipient cases	10				
Standard: 25 per cent of total admissions					
Per cent 25 . . . 10 *Points*					
0 . . . 0					
Quota.....					
24. Open-Air Classrooms, Preventoria or Day Camps					
Number of children attending at least six weeks [2] .	15				
Standard: 10 children per 1,000 grade school population (public and private)					
Children 10 . . . 15 *Points*					
0 . . . 0					
Quota.....					
[2] An adequate mid-day meal and rest period as a part of these facilities shall be necessary for a full score.					

E. HEALTH OF THE CHILD

HEALTH OF THE CHILD UP TO SCHOOL AGE

PRENATAL

25. **Field Nursing Service**

Number of nurses' visits made in behalf of prenatal cases by:

	No. Visits	No. Cases
Health Department		
Other Official Agencies		
Voluntary Agencies		

26. **Clinical Service**

Number of visits made by patients (either for advice or diagnosis) to all of the prenatal clinics of:

Health Department .....

Other Official Agencies .....

Voluntary Agencies .....

Number of patients registered at prenatal clinics of:

Health Department .....

Other Official Agencies .....

Voluntary Agencies .....

27. **Obstetrical Service**

a. Number of deliveries in hospitals [1] .....

[1] Where figures are available which make possible the exclusion of births within the city to non-resident mothers and the inclusion of births outside the city to resident mothers, this correction may be made.

b. Number of births attended by midwives .....

Are midwives registered?

By city .....

By state .....

Is there field supervision of methods and practice? .....

Is there authority to prohibit illegal practice? .....

Is there any effort to train midwives? .....

By whom? .....

E. HEALTH OF THE CHILD

	Value of Item	Value Assigned HD	OOA	VA	Total

HEALTH OF THE CHILD UP TO SCHOOL AGE

(Total Points 200)

PRENATAL (75)

25. **Field Nursing Service**

Number of nurses' visits made in behalf of prenatal cases 30

Standard: 1,000 visits per 1,000 total births [1]

Visits		*Points*
1,000	. . .	30
0	. . .	0

Quota.....

[1] The city's quota is obtained by multiplying 1,000, the standard number of visits required per one thousand births, by the number of thousands of births (both live and still). The number of visits made during the year in question, including all visits made by all organizations in the city doing prenatal work, should be divided by this quota. If this result is greater than 1 score 30, or if less than 1 multiply by 30 to obtain the credit.

Example: Assume 1,500 births and 1,200 prenatal nursing visits

$1{,}000 \times 1.5 = 1{,}500$ *Quota*

$1{,}200 \div 1{,}500 = 4/5 \times 30 = 24$, score to be credited

26. **Clinical Service**

Number of visits of prenatal cases to clinic . . . 25

Standard: 250 visits per 1,000 total births

Visits		*Points*
250	. . .	25
0	. . .	0

Quota.....

27. **Obstetrical Service (20)**

a. Per cent of deliveries in hospitals 12

Standard: 40 per cent of total births

Per cent		*Pts.*	*Pct.*		*Pts.*
40	.	12	10	.	2
30	.	8	0	.	0
20	.	4			

Quota.....

b. Midwives under competent supervision and control by registration and systematic inspection.....8 or, if such a system is not in force the score may be allotted on the basis of a small proportion of births attended by midwives as follows:

Per cent		*Pts.*	*Pct.*		*Pts.*
10	.	8	40	.	2
20	.	6	50	.	0
30	.	4			

Quota.....

INFANT

28. **Field Nursing Service**

Number of nurses' visits made in behalf of infants under 1 year of age by:

	No. Visits	No. Infants
Health Department	.....	.....
Other Official Agencies	.....	.....
Voluntary Agencies	.....	.....

Are certificates of birth registration delivered by nurse of:

Health Department .....

Other Official Agencies .....

Voluntary Agencies .....

29. **Clinical Service**

Number of visits of infants under 1 year of age to clinics of:[1]

Health Department .....

Other Official Agencies .....

Voluntary Agencies .....

Number of infants under 1 year of age registered at welfare clinics of:

Health Department .....

Other Official Agencies .....

Voluntary Agencies .....

[1] This item refers to all visits by babies, sick or well, made to all infant welfare clinics in the city at which a physician is in attendance, but a medical examination at each visit is not necessarily required.

30. **Supervision of Baby Boarding Homes**

Are baby boarding homes licensed? .....

By whom? .....

Is there regular inspection of baby boarding homes? .....

Frequency .....

Type of agency:

Nurse .....

Lay .....

INFANT (75)

	Value of Item	Value Assigned HD	OOA	VA	Total
28. **Field Nursing Service**					
Number of nurses' visits made in behalf of infants under 1 year of age	35				
Standard: 4,000 visits per 1,000 live births					
Visits 4,000 . . . 35 *Points*					
0 . . . 0					
Quota.....					
29. **Clinical Service**					
Number of visits to clinic made by infants under 1 year of age	35				
Standard: 2,500 visits per 1,000 live births					
Visits 2,500 . . . 35 *Points*					
0 . . . 0					
Quota.....					
30. **Supervision of Baby Boarding Homes**					
Inspection of baby boarding homes by nurse . . .	5				
Standard: Monthly inspections by nurse					
Inspections Monthly . . . 5 *Points*					
Bi-monthly . . . 3					
Semi-Annual . . . 1					
Annual . . . 0					

PRESCHOOL CHILD

31. **Field Nursing Service**

Number of nurses' visits made in behalf of preschool children (ages 1–4, inclusive) by:

	No. Visits	No. Patients
Health Department		
Other Official Agencies		
Voluntary Agencies		

32. **Clinical Service**

Number of visits [1] by preschool children (ages 1–4, inclusive) to clinics of:

Health Department .....

Other Official Agencies .....

Voluntary Agencies .....

[1] This item refers to all visits of preschool children to preschool clinics at which a physician is in attendance for physical examinations or consultations. It should not include visits to vaccination clinics where only smallpox vaccinations are performed, as extra credit for these is given in item 16 b.

Number of preschool children (ages 1–4, inclusive) registered at clinics of:

Health Department .....

Other Official Agencies .....

Voluntary Agencies .....

PRESCHOOL CHILD (50)	Value of Item	Value Assigned HD	OOA	VA	Total
31. Field Nursing Service					
Number of nurses' visits made in behalf of children, ages 1–4, inclusive	25				
Standard: 225 visits per 1,000 preschool population [1]					
Visits 225 . . . 25 *Points*					
0 . . . 0					
Quota.....					
32. Clinical Service					
Number of visits to preschool clinic made by children, ages 1–4, inclusive	25				
Standard: 500 visits per 100,000 total pop.					
Visits 500 . . . 25 *Points*					
0 . . . 0					
Quota.....					

[1] This figure may be estimated as 8.8 per cent of the total population or may be obtained from the chapter on Age Distribution, Vol. II of the Fourteenth Census, and adjusted on this basis.

HEALTH OF THE SCHOOL CHILD

33. Weighing

Number of children enrolled in school:

	Up to and including Eighth Grade	High School
Public		
Private [1]		

[1] Parochial schools shall be considered private throughout this schedule.

Number of schools:

Public		
Private		

School year:

From ..... to .....

a. Frequency of weighing of children
Record the number of schools in which all children, or all the children in some grade, are weighed periodically:

	All Children	Children in Some Grade
Monthly		
Twice a year		
Once a year		

b. Are parents notified of the weight?

Once a month .....

Twice a year .....

Once a year .....

How? .....

c. Are underweights [2] weighed?

Once a month .....

More frequently .....

[2] By "underweights" is meant those who are so considered by the standard in use in the school system under consideration, whether 7 per cent, 10 per cent, or 15 per cent under average weight for height and age.

HEALTH OF THE SCHOOL CHILD

(Total Points 150)

In framing this section the endeavor has been to select the most tangible indices of school health work such as can be expressed numerically.

The Superintendent of Schools should be interviewed and the answers to the questions secured from him, his deputy or the one he designates as most familiar with health work in the schools. If notified in advance it should be possible for the superintendent to have the desired information available, thus making unnecessary a trip to individual schools.

The surveyor should make clear to the superintendent the value of the appraisal in revealing the completeness of health activities within the city as measured against a carefully worked out standard.

There should be available for inspection:

i. Copies of regulations issued by the superintendent in use by the teachers including bulletins, outlines, courses of study of hygiene and related subjects, such as physical education and home economics.
ii. Records of the medical, nursing, dental, physical, educational or health educational work as required by the superintendent or his deputies in this field.
iii. Evidence of the work accomplished by the children themselves.

GENERAL NOTE: The term "grade school children" refers to the children in all schools, public and private.

33. **Weighing (10)**	*Value of Item*	*Value Assigned* HD	OOA	VA	*Total*
a. All children in some grade in 80 per cent of schools weighed	3				
Once per month . . . 3 *Points* Twice per year . . . 2 Once per year . . . 1					
b. Notification of weight sent to parents	5				
Once per month . . . 5 *Points* Twice per year . . . 3 Once per year . . . 2					
NOTE: It is believed that children profit by having their weight and their gain or loss brought regularly to the attention of their parents. This item requires that parents be regularly advised of the results of weighing children. Credit may be taken if this is done by including the weight as an item on the report card or by any other method accomplishing the same result.					
c. Underweights weighed	2				
Once per 2 weeks . . . 2 *Points* Once per 4 weeks . . . 1					

34. **Physical Examinations**

a. This item is intended to evaluate the work of the medical inspection service in conducting health examinations of grade school children in public and private schools. It is based upon two considerations: First, the proportion of the total grade school population which is examined annually; and second, the thoroughness of the examination as indicated by the time that is devoted to each individual.

Check usual frequency of school physical examination by physician:
Annually ..... Every 2 years .....
Every 4 years ..... Once in school career .....

Grades Examined Last Year	By Whom Examined	No. Pupils Examined	Rate Examined Children per Hour
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
Special Cases			

NOTE: If more than one plan of examination exists it should be noted to which schools each applies.

b. Are examinations of vision and hearing and measuring of height and weight conducted in schools by teacher?

Public .....

Private .....

By Nurse?

Public .....

Private .....

c. Are parents invited to be present at physical examination of children?

.....

Per cent of parents present .....

GENERAL NOTE

The ultimate purpose of the medical examination of school children is the well-being of the child which will be promoted by the correction or alleviation of defects thus revealed. We may look forward hopefully to the time when periodic visits to the family physician for a thorough health examination and a welcoming and understanding attitude on the part of the practitioner, will be as commonplace as periodic inspection visits to the dentist are coming to be.

For the present the medical examinations made by the schools or the health department are selected as an index of the appreciation of this work within a city. There are different systems of examination now in use. One is the cursory inspection by physicians, nurses and teachers with the burden of the complete examination thrown back on the family physician. Another is the more complete examination made by the physician in the schools. With the same amount of money available, the more time consumed on the examination the less the number of children reached. In the scoring the greater credit has been given the more thorough examination. No additional credit is given for exceeding 30 per cent of the school population annually. This recognizes the practical ideal of three complete examinations of a school child during his school career.

With regard to the time devoted to each child, it is recognized that the more deliberate examination at which the parents may be present, should be an educational experience for

34. Physical Examinations (45)	Value of Item	Value Assigned HD	OOA	VA	Total
a. Value of physical examination by physician based on per cent of grade school population examined, and rate of examination . . .	35				

If children are examined at the rate of:

6 Per Hour or Less:		7–13 Per Hour:	
Per cent Exam.	*pts.*	*Per cent Exam.*	*pts.*
30	35	30	29
25	31	25	25
20	26	20	21
15	21	15	17
10	16	10	13
5	11	5	9

14–20 Per Hour:		21–30 Per Hour:	
Per cent Exam.	*pts.*	*Per cent Exam.*	*pts.*
30	22	30	15
25	19	25	13
20	16	20	11
15	13	15	9
10	10	10	7
5	7	5	5

b. Inspection of vision and hearing, and measurement of height and weight conducted by teacher or nurse	5				

NOTE: This credit is given in recognition of the importance of teachers and nurses having first hand knowledge of the condition of the pupils and of relieving the physician by delegation of such routine examinations.

c. Parents notified of the time of physical examination by the physician and invited to be present	5				

NOTE: This item recognizes the desirability of parents being present when the physician examines their children and gives credit for systematic invitation of parents to be present at a definite time for this purpose.

---

parent, child, nurse, and teacher. The rate of examination varies in this item from 6 children per hour (10 minutes per child) to 30 per hour (2 minutes per child). The rates here expressed are the average rates and should be determined by dividing the number examined per year by the total number of hours actually devoted by physicians to the health examinations.

If both the thorough, sometimes called special, type of examination and the rapid or routine inspection are employed, credit may be given to each type by calculating the percentage and the rates of examination of each type separately and adding the separate score. The maximum score allowed, however, is 35 points.

For example:

		Rate of Conducting	Score
Total grade school population	10,000		
Total number of children examined	3,000		
Number of thorough examinations	500, or 5 per cent	— 6/hr.	11 pts.
Number of rapid inspections	2,500, or 25 per cent	—20/hr.	19 pts.
		Total score	30 pts.

In order to avoid unnecessary complications, the time devoted to dental inspection by dentist or hygienist has not been included in the above calculation of time.

35. Discovery and Correction of Defects

Children found with defects during last 12 mos. for which records are available.		Children who have had *defects corrected* during last 12 mos. for which records are available.	
Dated,	*No. of Children*		*No. of Children*
Teeth requiring:		Teeth:	
Filling		Filled	
Extraction		Extracted	
Cleaning		Cleaned	
Eyes defective		Fitted with glasses	
Hearing defective		Receiving treatment and special instruction	
Nose or throat defects		Operations for removal of adenoids or tonsils	
Heart defects		Placed under physicians' care	
Lung defects		Placed under physicians' care	
Skin defects		With defects corrected	
Glandular defects		Under treatment	
Orthopedic defects		Under treatment	
Underweight (10% or more)			
	Per cent of children		
At beginning of school year			
At end of school year			

35. **Correction of Defects** (30)	*Value of Item*	*Value Assigned* HD	OOA	VA	*Total*
Correction of defects per 1,000 grade school population expressed in terms of number of children having such defects corrected:					
a. Teeth Filled	5				
Standard: 100 individuals' teeth filled per 1,000 grade school population					
Indiv. 100 . . . 5 *Points*					
0 . . . 0					
Quota.....					
b. Teeth Extracted	3				
Standard: 90 individuals' teeth extracted per 1,000 grade school population					
Indiv. 90 . . . 3 *Points*					
0 . . . 0					
Quota.....					
c. Teeth Cleaned	3				
Standard: 300 individuals' mouths cleaned per 1,000 grade school population					
Indiv. 300 . . . 3 *Points*					
0 . . . 0					
Quota.....					
d. Glasses Fitted	5				
Standard: 50 individuals fitted with glasses per 1,000 grade school population					
Indiv. 50 . . . 5 *Points*					
0 . . . 0					
Quota.....					
e. Tonsil or Adenoid Operations	8				
Standard: 25 individuals operated upon per 1,000 grade school population					
Indiv. 25 . . . 8 *Points*					
0 . . . 0					
Quota.....					
f. Heart or Lung Defects placed under physicians' care	6				
Standard: 10 individuals per 1,000 grade school population					
Indiv. 10 . . . 6 *Points*					
0 . . . 0					
Quota.....					

NOTE: Owing to lack of uniformity in the meaning of the terms *Defect* and *Correction* only the more definite correctable defects have been selected as criteria of the effectiveness of the school health service in securing corrections. And for the same reason corrected defects are referred to school population rather than to defects recorded as present.

36. **Nurses' Visits**

Total number of visits of nurses on behalf of school children, whether made to the home, to a clinic, hospital, or elsewhere:

	No. Visits	No. Patients
Health Department	.....	.....
Other Official Agencies	.....	.....
Voluntary Agencies	.....	.....

NOTE: This does not include interviews with children by the nurse in schools.

37. **Sanitation of School Buildings**

a. Are all school buildings regularly inspected as to their hygienic conditions by an officer of the Health Department ..... or Department of Education ..... who observes and records the salient sanitary condition in each building?

Public Schools .....

Private Schools .....

How frequently? .....

b. Number of school buildings provided with:

Adequate lavatory facilities (1 bowl or equivalent length of sink to 80 children), including individual or paper towels .....

Adequate toilets (1 to 40 children) and toilet paper .....

Individual drinking cups or bubbling fountains .....

Number of schools in which all rooms are provided with:

Thermometers .....

Adjustable seats .....

36. Nurses' Visits	Value of Item	Value Assigned HD	OOA	VA	Total
Number of nurses' visits in behalf of grade school population	10				
Standard: 400 visits per 1,000 grade school population					
Visits 400 . . . 10 *Points*					
0 . . . 0					
Quota.....					
37. Sanitation of School Buildings (15)					
a. School buildings inspected once per year with reference to hygienic and sanitary conditions	5				
b. Sanitary facilities	10				
All schools provided with:					
Adequate lavatory facilities with individual or paper towels	2				
Adequate toilets and toilet paper . . .	2				
Individual drinking cups or bubbling fountains	2				
Schoolrooms in 90 per cent of buildings provided with:					
Thermometer	2				
Adjustable seats	2				
Standard:					
90 per cent of the buildings provided with 25 per cent or more adjustable seats in each room					

NOTE: This item assumes that the school plant is not in condition to operate hygienically or to give proper instruction in health subjects unless the facilities enumerated are present in each school building.

38. **Health Education**

a. Number of minutes per week devoted to definite health instruction in:

Grades		Grades	
1	.....	5	.....
2	.....	6	.....
3	.....	7	.....
4	.....	8	.....

Is textbook used in grades: 1 ..... 2 ..... 3 .....
4 ..... 5 ..... 6 ..... 7 ..... 8 .....

.....

b. Are children in any grade engaged in activities (designed to increase their knowledge of personal and public health, or to develop their health habits), such as the following:

Health Activities	Schools and Grades thus Engaged	
	No. of Schools	Grades
Inspection of places of health and sanitary interest	.....	.....
Writing of essays on health . .	.....	.....
Daily recording of health habits .	.....	.....
Making of health books . . .	.....	.....
Making of health posters . . .	.....	.....
Supervision of ventilation . . .	.....	.....

39. **Recreation**

a. Number of acres of playground area within the built-up portions of the city .....

b. Is there organized direction of recreation, as evidenced by presence of a recreation commission, organization, or paid director? .....

c. Total participating attendance all playgrounds .....

38. **Health Education (25)**	*Value of Item*	*Value Assigned* HD	OOA	VA	*Total*
a. Systematic instruction in health	10				
Standard: 40 minutes per week in all grades devoted to definite instruction based upon a standard textbook in grades above the third					
Minutes 40 . . . 10 *Points*					
20 . . . 5					
0 . . . 0					
Quota.....					
b. All children in some grade in 80 per cent of schools engaged in activities (designed to increase their knowledge of personal and public health, or to develop their health habits) such as the following:					
Inspection of places of health and sanitary interest					
Writing of essays on health					
Daily recording of health habits					
Making of health books					
Making of health posters					
Supervision of ventilation					
If effective work of this nature is conducted in:					
Any one of the first five grades, score 5 or 0					
Any of the grades 6, 7 or 8, score 10 or 0					
One or more grades of both groups, score 15 or 0					
Throughout the entire school system	15				
NOTE: The scoring between 0–5, 0–10, 0–15, should be based upon the per cent of schools in which the work is carried out.					
39. **Recreation (15)**					
a. Playground Area	5				
Standard: Acres of playground area, within built-up portions of the city, per 1,000 total school population.					
Acre 1 . . . . 10 *Points*					
¼ . . . 0					
Quota.....					
b. If there is organized direction of recreation as evidenced by presence of a recreation commission, organization, or paid director . .	5				
c. Attendance at playground	5				
Standard: 20,000 participating attendance annually per 1,000 total school population.					
Attendance 20,000 . . . 5 *Points*					
15,000 . . . 4					
10,000 . . . 3					
5,000 . . . 2					
Quota.....					

F. SANITATION: FOOD AND MILK CONTROL; WATER; SEWERAGE

40. **Sanitary Inspection Service**

a. Number of sanitary inspections and reinspections (exclusive of plumbing inspections, smoke inspections, food inspections and all communicable disease work) .....

b. Number of orders issued for improvement of sanitary conditions .....

Number of such orders complied with .....

41. **Food-Handlers and Food Establishments** [1]

a. Number of physical examinations for communicable diseases, including tuberculosis and venereal diseases, of persons employed in food-handling establishments .....

Is there any effort made to instruct persons employed in food-handling establishments in personal hygiene and hygiene of food-handling:

By lecture at time of physical examination? .....

By demonstration at physical examination or at time of inspection of establishment? .....

By printed matter? .....

If so, by whom? .....

b. List types of food-handling establishments which are licensed .....

.....

c. Number of inspections and reinspections of food-handling establishments [2] .....

[1] The term "food-handling establishments" as used in these items shall be defined to mean hotels, restaurants, bakeries, meat markets, slaughter houses and soda fountains.

[2] Ante-mortem and post-mortem examinations of meat and examinations of all food products are excluded from this item.

F. SANITATION: FOOD AND MILK CONTROL; WATER; SEWERAGE (Total Points 175)

	Value of Item	*Value Assigned* HD	OOA	VA	*Total*
40. Sanitary Inspection Service (20)					
a. Number of sanitary inspections and reinspections	10				
Standard: 3,000 inspections per 100,000 population					
Inspections 3,000 . . . 10 *Points*					
0 . . . 0					
Quota.....					
b. Per cent of insanitary conditions remedied . . .	10				
Standard: 80 per cent					
Per cent 80 . . . 10 *Points*					
70 . . . 7					
50 . . . 1					
0 . . . 0					
Quota.....					
41. Food-Handlers and Food Establishments (15)					
a. Annual physical examination of food-handlers for communicable disease which has as a part of the service instruction in the hygiene of food handling and personal hygiene by lecture or demonstration, or both	5				
b. If food-handling establishments are licensed .	5				
c. Number of inspections and reinspections of food-handling establishments per 100,000 population	5				
Standard: 4,000 inspections per 100,000 population					
Inspections 4,000 . . . 5 *Points*					
0 . . . 0					
Quota.....					

42. **Milk Supply Control**

a. Per cent of milk supply pasteurized [1] .....

b. Number of producing farms .....

Number of inspections .....

c. Control of distributing plants:

i. Number of inspections of pasteurizing plants .....

Number of inspections of non-pasteurizing plants .....

ii. Number of pasteurizing plants equipped with thermometers .....

d. Number of milk samples before pasteurization showing a bacterial content in excess of 500,000 per c.c. .....

Number of analyses of milk before pasteurization .....

e. Number of milk samples after pasteurization showing a bacterial content in excess of 50,000 per c.c. .....

Number of samples of pasteurized milk analyzed .....

f. Is all bottled milk required by ordinance to be plainly marked to show:

Producer, or distributor? .....

Grade? .....

Date of production (in the case of raw milk) .....

or date of pasteurization (in the case of pasteurized milk)? .....

Annual milk consumption in gallons .....

Number of milk distributing plants:

Pasteurizing .....

Non-pasteurizing .....

[1] A committee of the American Public Health Association has been appointed to define pasteurization. At present, existing state standards should be used where such are in force.

42. Milk Supply Control (60)	Value of Item	Value Assigned HD	OOA	VA	Total
a. Per cent of the milk supply pasteurized . . .	25				
Standard: 100 per cent					
Per cent 100 25 *Pts.* *Pct.* 50 10 *Pts.*					
90 20 30 0					
75 15					
Quota.....					
b. Frequency of inspection of dairy farms . . .	5				
Standard: Semi-annual . . . 5 *Points*					
Annual . . . 3					
c. Control of distributing plants	5				
i. Periodic inspection of pasteuring plants, score 3					
Standard: Once a week				•	
Weekly . . . . . 3 *Points*					
Each 2 weeks . . . 2					
Monthly 1					
ii. Systematic effort to install recording thermometers, score 2					
Standard: Per cent of pasteurizing plants with thermometers					
Per cent 100 . . . 2 *Points*					
75 . . . 1					
0 . . . 0					
Quota.....					
d. Per cent of milk samples before pasteurization showing a bacterial content in excess of 500,000 per c.c.[1]	5				
Standard: 4 per cent					
Per cent 4 5 *Pts.* *Pct.* 13 2 *Pts.*					
7 4 16 1					
10 3 19 0					
Quota.....					
e. Per cent of pasteurized samples showing a bacterial content in excess of 50,000 per c.c. . .	15				
Standard: 4 per cent					
Per cent 4 15 *Pts.* *Pct.* 16 4 *Pts.*					
8 12 20 0					
12 8					
Quota.....					
f. All bottled milk required by ordinance to be plainly marked to show	5				
Producer or distributor 1					
Grade 2					
Date of Production, or Pasteurization . 2					

[1] Score for this item should only be given when the samples of milk analyzed are reasonably well distributed throughout the year, as it would be manifestly unfair to give credit for low counts obtained only during the winter months.

43. **Water**

Does the city water meet the U. S. Treasury Department standard of purity? .....

Per cent of dwellings receiving city water .....

Has there been any change in the source of water supply in the last 5 years? .....

What? .....

Has there been any change in the type or method of purification in the last 5 years? .....

What? .....

*Frequency of laboratory examinations of municipal supply:

Daily .....

Weekly .....

Monthly .....

Less frequent .....

44. **Sewerage**

a. Per cent of dwellings [1] sewer connected .....

[1] This item refers to dwellings connected with a system of sewers in the public streets, and does not include dwellings connected with individual cess pools, septic tanks, or similar local means of sewage disposal.

b. Per cent of dwellings having non-flyproof privies .....

Number of privies in the city .....

What is the means of sewage disposal? .....

Is there any treatment of sewage? .....

43. **Water**	*Value of Item*	*Value Assigned* HD	OOA	VA	*Total*
Local water meeting U. S. Treasury Department standards for drinking water on common carriers, and generally available	40				

NOTE: The score on water supply is based upon quality and distribution. Water which meets the U. S. Treasury Department standards of purity for water on common carriers in Interstate Commerce will be entitled to a perfect score on quality. This score, 40 points, should then be multiplied by the per cent of dwellings receiving city water in order to arrive at the score for the city.

Example: City water meeting U. S. Treasury Department standards score 40 points
80 per cent distribution
40 × .80 = 32 points, city's score on water supply

Where water supply has not been submitted to examination for Treasury Department certificate, the following alternative score may be used to be multiplied as above by per cent of dwellings supplied.
Per cent of 10 c.c. domestic samples showing B. Coli
Standard: 20 per cent or less 40 points
Over 20 per cent, 0

44. **Sewerage (40)**

a. Per cent of dwellings connected with street sewers 30

Standard: 100 per cent

Per cent		*Points*
100	. . .	30
90	. . .	20
80	. . .	10
60	. . .	0

Quota.....

b. Per cent of dwellings having non-flyproof privies 10

Standard: 0 per cent

Per cent		*Points*
0	. . .	10
5	. . .	5
10	. . .	0

Quota.....

G. LABORATORY

45. **Laboratory Examinations** [1]

Is there an organized local laboratory service of a public character, giving to the community the usual free services? .....

Record of Examinations

Report All Examinations Made for the City Specifying in what Laboratory Made

Disease, or Material	Total Number	Where Made
Water: Bacterial		
Chemical		
Milk: Bacterial		
Chemical		
Food and Drugs		
Pathological		
Typhoid: Cultures		
Widal		
Tuberculosis		
Diphtheria		
Syphilis: Darkfield		
Wassermann		
Gonorrhea		
Malaria		
Plague		
Rabies		
Urine		
Feces		
Other		
Grand Total		

[1] Credit may be taken in this item in accordance with the standards noted when the usual free diagnostic services are available to the community either by the local health department laboratory or through contract with a local private laboratory; or through arrangement with a state laboratory which can provide a prompt service (24 hour service in diphtheria, and correspondingly prompt in other diseases).

G. LABORATORY (Total Points 70)

	Value of Item	Value Assigned HD	OOA	VA	Total
45. **Laboratory Examinations per Annum** [1] **(70)**					
a. Diphtheria	20				
Standard: 250 per annual death					
Exams. 250 20 *Pts.* *Exams.* 60 5 *Pts.*					
150 15 0 0					
100 10					
Quota.....					
b. Typhoid	7				
Standard: 75 per annual death					
Exams. 75 7 *Pts.* *Exams.* 20 3 *Pts.*					
70 6 0 0					
50 5					
Quota.....					
c. Tuberculosis	8				
Standard: 5 per annual death					
Exams. 5 8 *Pts.* *Exams.* 2 2 *Pts.*					
4 6 0 0					
3 4					
Quota.....					
d. Syphilis	5				
Standard: 12 per case reported					
Exams. 12 5 *Pts.* *Exams.* 5 2 *Pts.*					
10 3 0 0					
Quota.....					
e. Gonorrhea	5				
Standard: 5 per case reported					
Exams. 5 5 *Pts.* *Exams.* 0 0 *Pts.*					
Quota.....					
f. Milk	15				
Standard: 100 per 100,000 gallons					
Exams. 100 15 *Pts.* *Exams.* 30 5 *Pts.*					
50 10 20 0					
Quota.....					
g. Water	10				
Standard: 1 examination daily					
Exams. Daily . . . . 10 *Points*					
Weekly 8					
Monthly . . . 2					

[1] See Note 1 on opposite page.

H. POPULAR HEALTH INSTRUCTION

46. Use of Pamphlets, Bulletins, Press, Lectures and Moving Pictures

a. What educational health pamphlets were distributed during preceding year? .....

.....

.....

.....

.....

b. Were weekly health bulletins distributed? .....

c. Were monthly health bulletins distributed? .....

d. Was there systematic newspaper publicity? .....

Principal topics .....

.....

.....

.....

.....

.....

.....

e. List principal lectures on public health last year and by whom given

.....

.....

.....

.....

.....

.....

f. List showings of motion pictures on health last year, subject of picture, audience [1] and by whom shown .....

.....

.....

.....

.....

.....

.....

[1] The term "audience" refers to the type—school children, adults, women's clubs, men's clubs, industrial workers, etc.

H. POPULAR HEALTH INSTRUCTION
(Total Points 20)

46. **Use of Pamphlets, Bulletins, Press, Lectures and Moving Pictures (20)**

	Value of Item	*Value Assigned* HD	OOA	VA	*Total*
Educational measures:					
a. Educational health pamphlets	2				
NOTE: This score will be allotted if provisions are made for the distribution of pamphlets or circulars in regard to the control of communicable disease, infant welfare, and the like.					
b. Weekly health bulletins	2				
c. Monthly health bulletins	5				
d. Systematic newspaper publicity	6				
NOTE: To score on this item there must be maintained a file of the new articles appearing throughout the year.					
e. Public lectures on health	2				
f. Showing of motion pictures on health	3				

City..... Pop..... Grade School Pop.....

Total Points..... Live Births..... Stillbirths.....

Rated by..... Checked by..... Date.....

A. Vital Statistics (60)

1. *Registration*
   - a. 4 .....
   - b. 4 .....
2. *Checking and Verification*
   - a. 4 .....
   - b. 6 .....
   - c. 6 .....
3. *Indexing*
   - a. 2 .....
   - b. 2 .....
4. *Classification and Compilation*
   - a. 4 .....
   - b. 2 .....
   - c. 2 .....
   - d. 2 .....
   - e. 2 .....
   - f. 2 .....
   - g. 4 .....
   - h. 6 .....
5. *Interpretation and Application*
   - a. 2 .....
   - b. 2 .....
   - c. 4 ..... Sec.T.....

B. Communicable Disease Control (175)

6. *Reporting*
   - a. 4 .....
   - b. 4 .....
   - c. 4 .....
   - d. 3 .....
   - e. 3 .....
7. *Record Keeping*
   - a. 10 .....
   - b. 6 .....
   - c. 6 .....

Control Practices

8. *Diphtheria Control*
   - a. 2 .....
   - b. 2 .....
   - c. 2 .....
   - d. 2 .....
   - e. 6 .....
9. *Typhoid Control* 3 .....
10. *Smallpox Control* 5 .....
11. *Scarlet Fev. Con.* 5 .....
12. *Ophthalmia Con.* 5 .....

Control Practices

13. *Visits to Cases*
    - a. 4 .....
    - b. 4 .....
    - c. 4 .....
    - d. 4 .....
    - e. 4 .....
    - f. 3 .....
    - g. 3 .....
14. *Diagnostic Ser.* 5 .....
15. *Hospitalization*
    - a. 8 .....
    - b. 8 .....
    - c. 8 .....
    - d. 8 .....
16. *Immunization*
    - a. 30 .....
    - b. 10 ..... Sec.T.....

C. Venereal Disease Control (50)

17. *Reporting* 12 .....
18. *Clinical Ser.*
    - a. 10 .....
    - b. 20 .....
19. *Cases Returned to Physician or Clinic* 8 ..... Sec.T.....

D. Tuberculosis Control (100)

20. *Reporting* 10 .....
21. *Field Nurs. Serv.*
    - a. 20 .....
    - b. 5 .....
22. *Clinical Service*
    - a. 15 .....
    - b. 10 .....
23. *Hospitalization*
    - a. 15 .....
    - b. 10 .....
24. *Open-air Classrooms, Preventoria or Day Camps* 15 ..... Sec.T.....

E. Health of the Child

Health of the Child up to School Age (200)

Prenatal (75)

25. *Field Nurs. Ser.* 30 .....
26. *Clinical Service* 25 .....
27. *Obstetrical Ser.*
    - a. 12 .....
    - b. 8 ..... Sub.T.....

Infant (75)

28. *Field Nurs. Ser.* 35 .....

29. *Clinical Service* 35 .....
30. *Supervision of Baby Boarding Homes* 5 ..... Sub.T.....

Preschool (50)

31. *Field Nurs. Ser.* 25 .....
32. *Clinical Service* 25 ..... Sub.T.....

Sub.Sec.T.....

Health of the School Child (150)

33. *Weighing*
    - a. 3 .....
    - b. 5 .....
    - c. 2 .....
34. *Physical Exams.*
    - a. 35 .....
    - b. 5 .....
    - c. 5 .....
35. *Cor. of Defects*
    - a. 5 .....
    - b. 3 .....
    - c. 3 .....
    - d. 5 .....
    - e. 8 .....
    - f. 6 .....
36. *Nurses' Visits* 10 .....
37. *San. School Bldg.*
    - a. 5 .....
    - b. 10 .....
38. *Health Ed.*
    - a. 10 .....
    - b. 15 .....
39. *Recreation*
    - a. 5 .....
    - b. 5 .....
    - c. 5 ..... Sub.Sec.T.....

Sec.T.....

F. Sanitation; Food and Milk Control; Water; Sewerage (175)

40. *San. Inspection*
    - a. 10 .....
    - b. 10 .....
41. *Food-Handlers and Food Estab.*
    - a. 5 .....
    - b. 5 .....
    - c. 5 .....
42. *Milk Supply Control*
    - a. 25 .....
    - b. 5 .....
    - c. 5 .....
    - d. 5 .....
    - e. 15 .....
    - f. 5 .....
43. *Water* 40 .....
44. *Sewerage*
    - a. 30 .....
    - b. 10 .....

Sec.T.....

G. Laboratory (70)

45. *Laboratory Exams.*
    - a. 20 .....
    - b. 7 .....
    - c. 8 .....
    - d. 5 .....
    - e. 5 .....
    - f. 15 .....
    - g. 10 .....

Sec.T.....

H. Popular Health Instruction (20)

46. *Use of Pamphlets Etc.*
    - a. 2 .....
    - b. 2 .....
    - c. 5 .....
    - d. 6 .....
    - e. 2 .....
    - f. 3 ..... Sec.T.....

Grand Total.....

.....

Record new methods and special services not already covered

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THE GORDON BELL MEMORIAL LECTURE

by

MAZŸCK P. RAVENEL, M.D.

on

The Prolongation of Life. To what goal is it tending?

Given under the auspices of the Winnipeg Medical Society
at Winnipeg, April 3, 1925

AMERICAN PUBLIC HEALTH ASSOCIATION

370 SEVENTH AVENUE, NEW YORK CITY

THE PROLONGATION OF LIFE
TO WHAT GOAL IS IT TENDING?

NEVER in my life has an invitation come to me which I considered so great an honor as that from your committee to give the Gordon Bell Memorial Lecture. My immediate impulse was to accept, as it gave me an opportunity to pay a tribute to a man whom I was privileged to know quite well for a number of years, and, needless to add, one to whom I gave admiration and affection without reserve. My second thought made me realize how greatly I failed to measure up even to my own conception of what the occasion demanded, and I finally accepted with many misgivings, realizing that my only qualifications for the post sprung from the reverence in which I hold the memory of the brilliant and much loved man whose name is perpetuated in these addresses.

Dr. Bell has been spoken of as a physician who was a "universal consultant." Profound as was his knowledge of his chosen profession, his scientific interests were not confined within its limits; all nature was his field, and he delighted in studying her works and in unfolding her secrets. On one occasion we were discussing wild fowl and the domestication of wild ducks, in which I had been much interested through the experiments at the Storrs Experiment Station in Connecticut. It will not surprise you, as it did me at that time, to hear that it was he who had located the breeding grounds and made many of the arrangements which insured the success of the undertaking.

Another picture of him I carry in my mind is that of the sympathetic physician. In January, 1917, on my way to Saskatoon, the opportunity came for me to visit Dr. Bell. While in his office, a young man from Brandon was brought in by his father—one of those splendid young Canadians who were the victims of the first gas attack. It was the first gassed soldier I had seen, and it made a lasting impression; but not more so than did the fine way in which Bell—the physician, the patriot and the man—treated the boy and his distressed father.

It is useless for me to eulogize Gordon Bell before a Canadian audience. Nothing I can say will add to his fame or elevate him to a higher place in your hearts than he already occupies. His broad humanitarianism, his knowledge of human nature and his love of man would all have enlisted his service in the interest of a better future. Never, perhaps, has the world been in more need of wisdom and understanding. The cataclysm of war has made millions of young men think of matters formerly accepted without question. The failures of readjustment, the lack of good faith shown by some nations and the political jockeying evident in others, the selfishness and the general displacement of values are all signs which compel us to think of the future and to query the wisdom of our course in the past. Can anyone doubt that Dr. Bell would have been among the foremost in seeking a wise solution of the problems which confront us?

Let me quote the *Manitoba Free Press:* "The best answers to the materialist, the cynic, the money-grubber, the scorner of public duty, the disbeliever in all motives save those that serve self-interest, are lives such as that lived by Dr. Bell. Not only are they answers to the doctrines of earth, but it is examples such as this which purify our civic life by lighting the

fires which show the paths of duty and service to the generations."

In seeking an appropriate subject for this occasion, it seemed fitting to select one in line with Dr. Bell's chief interests —public health in its broadest application. With this object, I have elected to discuss the prolongation of life with its effect on population, food supply and man's relation to his fellow man.

If we may judge of primitive man by the wild animals as we know them to-day, he did not suffer from the senile changes which bring distress to all who even approach the allotted span of life, and there is no record of his having questioned the meaning of life and death, or having speculated concerning the length of his lease on earthly existence. Early in recorded history, however, such evidence comes into view, and with increasing insistence man has delved into the problems which have found their most beautiful expression in the prayer of the Psalmist: "Lord, let me know mine end and the number of my days; that I may be certified how long I have to live."

Biological investigation has made certain facts clear. "Science has made the shadow of death more intelligible" even though it has not softened its pangs, nor lessened man's fear of it, which Metchnikoff held was implanted in our being for the preservation of the species. At the bottom of the scale we find unicellular organisms which are immortal in the sense that natural death does not occur among them, rejuvenescence keeping pace with senescence. Woodruff saw no case of natural death in a culture of Paramecium in 8,500 generations, equal to a quarter of a million years of human life if the generations were of equal length, and at the end of that time the culture was going as well as at the beginning.

As we go up in the scale of life, senescence, senility and death become the rule. The more complex and specialized organism has lost the power of piecemeal restoration seen in the very simple forms and probably in some multicellular animals, as Hydra and the Planaria,* through which they avoid old age. In the lower forms the instability of the substratum and the consequent lack of individuation permits frequent rejuvenescence of a high degree, while in higher forms death is inevitable because of the greater stability of the substratum. As life becomes more worth living and the organism more of an agent, the capacity for rejuvenescence becomes limited.[1] "For his high degree of individuation, man pays the penalty of individual death, and the conditions and processes in the human organism which lead to death in the end are the conditions and processes which make man what he is."[2] "Strange and paradoxical as it may seem, this gradual, natural decay and death, with the physiological processes which bring them about, do not appear to present themselves in the ordinary economy of nature, but to be dependent upon the sheltering influences of civilization for the opportunity to manifest themselves and to continue their work."[3] It is evident that senility and death are products of evolution, and that natural death is relatively a new thing, which came as a consequence of differentiation of structure and function.

Valuable as are the facts uncovered, and interesting as may be the speculations based on them, we must pass on to another phase of our subject and consider what has actually been accomplished in postponing the common fate. Here we are limited by the paucity of vital statistics in the past. Although from time to time some one rises to defend the accuracy of the Biblical ages ascribed to Adam and his family, we may dismiss them with the statement that the word translated

* Morgan estimates that for *P. maculata*, a portion one-two hundred and fiftieth of the original worm will regenerate and grow into a complete animal. Child[2] says that the reconstituted animals are younger physiologically than the parent from which the pieces were taken. The process of reconstitution brings about a degree of rejuvenescence. The metabolism of the separated piece is higher than that of the same region from which it was taken; it is younger than when it was a portion of the parent.

The same general statement holds true for Hydra and the hydroid Corymorphia.

"years" may with equal accuracy mean "months," and on this basis even Methuselah would have been only eighty years of age, which is probably near the truth.* Even the "three score years and ten" was perhaps optimistic for the average man of those times, though some individuals like Jacob and Moses seem to have lived far beyond that age.

The oldest records with which we can compare modern longevity with any approach to accuracy are those found on mummy cases of about 2,000 years ago, and which have been analyzed by Karl Pearson.[4] The expectation of life among these Romano-Egyptians was a little over 30 years. The mortality during the early and middle periods of life was far above that in most countries to-day; but about the age of 68 their expectation became greater than that of the modern American or Englishman. Pearson explains this by saying that only the hardiest could survive the perils of early life and attain this age. Very few comparatively survived to this age, but those who did had a greater expectation of life than moderns of the same age. Of 100 English alive at 10 years of age 39 live to be 68, while less than 9 Romano-Egyptians reached that age. Macdonell was able to analyze the records of many thousand Roman citizens who lived during the first three or four centuries after Christ. For Rome, and the provinces Hispania and Lusitania, up to about 25 the expectation of life was bad, especially so in the city of Rome, but from about the age of 60, the expectation was better than at present. In the African provinces conditions were much better and the expectation from about the age of 40 was markedly better than it is to-day.

The first life table constructed on computations comparable to those of to-day was made by the astronomer Halley,[5] who is more familiar to most of us in connection with the comet bearing his name than as a statistician, published in 1693. Based on the mortality of Breslau for the years 1687–1691 it shows that the expectation of life at birth in that city was 33 years, less by approximately 18 years than in the United States in 1910.

There is a constant though diminishing difference in favor of the United States to the age of 80, where the lines cross. In view of certain inaccuracies and lack of material, Pearl does not lay stress on the indicated greater expectation after 80. It is certain, however, that for early ages the expectation of life was greatly below that of to-day, while for advanced ages it was about the same.

The expectation of life in England about the middle of the 18th century shows improvement over Halley's table, though it was much below that of the present. At birth it was 39 years, 12 years less than in the United States in 1910. By the age of 45 it was about the same, at 47 became greater, and remained so for practically all of the higher ages.

The great sanitary awakening in England with which the names of Chadwick and Simon will always be linked began in 1838. Under the inspiration of their work Shattuck, in 1850, drafted a report which marked the rousing of America. The revolution of ideas and methods, and the placing of health work on a basis of scientific knowledge came soon after due to the epoch-making discoveries of Pasteur, when modern preventive medicine with all its blessings was born and the emphasis was shifted from man's environment to man himself. Along many lines not directly connected with man's physical well-being marvelous advances have been made which may well be borne in mind in considerations bearing on longevity. What has been the result? In the United States the expectation of life at birth has risen to 58 years, 20 years having been added during a century, and 10 during the past 20 years. In England the expectancy

* This explanation begets other difficulties, since it makes Enos, Cainan and others become fathers at from 5 to 7 years of age. However, from what we know of the fecundity of the patriarchs, this is more easy to believe than that they lived several hundred years.

has risen from 39 years in the 18th century to 51 at the present. Such figures may be taken as representative of the trend of longevity, except for certain overcrowded countries like India, where, in spite of English control, the expectation of life at birth is only a little more than 27 years.

TABLE I

DEATH RATE PER 1,000 INHABITANTS AT EACH AGE

	Periods	0–1 Year	1–5 Years
Prussia	1876–85	275	37
	1906–14	189	16
Denmark	1876–84	166	20
	1906–15	108	7
France	1877–86	226	29
	1908–13	128	13
England and Wales	1876–85	167	29
	1906–15	130	16
Scotland	1876–85	136	29
	1906–15	130	19
Ireland	1876–85	118	20
	1909–12	111	14
Italy	1877–85	271	64
	1907–14	168	31
Norway	1881–85	106	24
	1906–15	72	8
Netherlands	1875–84	216	30
	1905–14	119	13
Sweden	1876–85	136	26
	1906–13	79	9
Switzerland	1876–85	233	20
	1906–15	124	9
Bavaria	1876–85	425	31
	1907–14	241	15

TABLE IA

INFANT MORTALITY RATES IN THE UNITED STATES AND CERTAIN FOREIGN COUNTRIES, COMPILED FROM OFFICIAL SOURCES FROM LATEST FIGURES AVAILABLE, OCTOBER 1, 1924[7]

Country and Year	Infant mortality rate*
Australia, 1922	53
Austria, 1920	155
Belgium, 1921	122
Chile, 1922	240
Denmark, 1922	69
England and Wales, 1923	69
Finland, 1921	95
*France, 87 Depts., 1921	116
Germany, 1921	133
Hungary, 1922	200
Irish Free State, 1922	69
Japan, 1922	166
The Netherlands, 1922	77
New Zealand, 1922	42
Norway, 1919	62
Scotland, 1922	101
Spain, 1922	145
Sweden, 1918	65
Switzerland, 1921	74
Union of South Africa, 1921	77
U. S. Birth Registration Area, 1923	77
Uruguay, 1922	94

* Deaths under 1 year per 1,000 live births. In case of France deaths of live born infants which occurred before the registration of births (within 3 days of birth) are omitted from both births and deaths in calculating the infant mortality rate.

We have been so busy rejoicing over our control over most of the communicable diseases, and in spreading the gospel of good health to the utmost parts of the earth that most of us have neglected to analyze our results or to ask whither our course was leading.

The first fact which should attract our attention is that the greater part of the increase in life expectation is due to the lessened mortality of babies under 5 years of age. Within 20 years a number of large cities of the world have had death rates of 400 or more for every 1,000 infants born. In 1900, eight cities in the United States had rates running from 300 to 419 per 1,000. In 1924, the American Child Health Association published the 1923 figures for 665 cities. In those of 50,000 and above, the infant death rate varies from 41 to 169 per 1,000 births. In 1923, for the cities in the birth registration area the average was 78 per 1,000. The trend is well shown by the rate of Massachusetts, 1851–1923. Beginning with 130 deaths per 1,000, the rate rose fairly regularly to nearly 200 in the early 70's, since which it has steadily declined to 78 in 1923.

The first life table constructed in America was that of Dr. Wigglesworth, 1789, based on 4,893 deaths.[5] Of these, 1,942 or 39.7 per cent occurred under 5 years of age. In 1920, for the registration area of the United States (82 per cent of population), 10.8 per cent of deaths were in the first 5 years of life. The same tendency is found in almost every country, as shown in Table I.[6]

For England and Wales the infant mortality, taken in 5-year periods, remained fairly constant from 1841 to 1900, ranging from 139 to 157 per 1,000 births; but since then a marked and steady reduction has taken place, down to 90 for the 1916–1920 quinquennium and 69 for 1923. For the later years of life most European countries show an improvement in the death rate for practically all ages, though it is most marked for the earlier years. In the United States not only has there been no improvement for the later ages, but we have lost ground. Very recently there is some evidence of improvement, which is not conclusive.

Dublin[8] has recently constructed a

hypothetical life table, and given estimates which show that 7 years can be added to the average life span in the United States, making it 65 instead of 58 years as at present. Four years have been added between 1910 and 1920, but five or six countries are still ahead of us in this respect, led by New Zealand, with an expectation of 60 years. Taking the figures for 1910, he assumes a reduction of approximately two-thirds in the death rate for the 0–5 year period; two-thirds to one-half for 5–10; one-half 10–60; one-half to no reduction 60–70, and no reduction for the later ages. In view of what has been accomplished since 1900, his estimates do not seem oversanguine. Great stress is rightly placed on the infant death rate, which has shown no improvement for the first month of life. The assumed infant death rate is 38.2 per 1,000 births, but slightly lower than the present rate in a few cities. The death rate from tuberculosis has fallen from 195.2 per 100,000 in 1900 to 92.3 for 1922 in the registration area. Typhoid fever has been reduced 75–80 per cent in the same period in many cities. No allowance has been made for saving from cancer. The table gives to those who survive to 20 years an expectation of 50 years more, or 70 years in all, the Biblical span of life.

During the 2,000 or more years for which we have some records, man has advanced in the sense that he has adapted himself to his environment, or else has been able to bring his environment under such control as to fit it to himself. There can be no question that in many ways he has controlled his environment, but in spite of the many wonderful advances made in science, biologists can see no evidence of advance in inherent capacity over the Crô-Magnon man of perhaps 30,000 years ago. Indeed his stature and his brain capacity were greater than ours.

The desire to prolong life has led to many studies of considerable interest and some results which cannot be lightly cast aside. When we remember the profound influence of many glands on the body and its functions, and that reproduction is the chief object of physical life, it is not surprising that the glands concerned in reproduction should be suspected of having something to do with the preservation of youth. Weismann regards the limitation of life as an adaptation brought about by natural selection, since, as he expresses it, the continuance of life after the reproductive period is a "senseless luxury," and von Hansemann attributes old age and death to atrophy of sexual organs and elimination of the germ plasm.

The discoveries of the future may revolutionize all of our ideas, as those of the past have done, but it is hard to believe that we carry about in our bodies the elixir of life, or a fountain of eternal youth, the utilization of which has remained undiscovered by the body during its many years of evolution, though set free by simple procedures.

INFLUENCE OF HEREDITY

One factor which can be depended upon as tending to produce long life is heredity. Studies by Karl Pearson and Miss Beeton on groups taken from Foster's *Peerage*, Burke's *Landed Gentry*, records of the English Society of Friends and the Friends' Provident Association, have shown unmistakably the influence of inheritance on longevity. Pearson concluded that from 50 to 75 per cent of the general death rate among the groups examined was determined fundamentally by factors of heredity, which is the same practically as saying that heredity determines fundamentally the duration of life. Ploetz [9] has given evidence, taken from the records of royal families of Germany on the one hand, and from the middle class on the other, that infant and child mortality is less in stocks of greater longevity. In both classes the percentage of children dying under 6 years decreases as the age at death of the parents increases. This is true for parents so old that their deaths

could not have occurred during the first 5 years of life of their offspring, as well as for younger parents; and also for royal families in which the death of a parent could not have occasioned neglect of the child. Natural selection acts not only on parents who lack vigor, but also on their offspring, thus tending to eliminate stocks of defective vitality.

In the study of the Hyde family by Alexander Graham Bell,[4] it was shown that where neither parent lived to 80 years, 5.3 per cent of the children lived to 80 or over, based on 827 cases; where one parent only lived to 80 years or more, 9.8 per cent of the children lived to 80 or over, based on 583 cases; where both parents lived to 80 or more, 20.6 per cent of the children lived to 80 or over, based on 184 cases.

Four times as many persons attained great age when both parents lived to 80 or over, as when neither parent did. The average age at death of those whose parents both reached 80 years was 52.7 years, while the average of those whose parents died below the age of 60 was 32.8 years. The longevity of the parents of the first group added 20 years to their life as compared with the second group. Since longevity is inherited, the converse is true, and in saving the lives of those who are weak and short-lived through heredity, as we are doing, it is possible that we may eventually reduce the longevity of the race as a whole. In this as in other respects "a man cannot be too careful in the choice of his parents."

Some years ago Professor Irving Fisher calculated the average prolongation of life which would follow the application of scientific knowledge to a group of 90 diseases, the percentage of preventability of which had been estimated by prominent medical men. His results showed that if the ratios of preventability were fully realized, the average expectation of life would be raised almost 13 years, 7 years less than the gain of the group mentioned above in which both parents lived to be 80 or over, or, in other words, 7 years short of what we could reasonably expect to gain by parental selection in one generation. We see again that our efforts have not added to the span, but only to the average expectation of life.

INCREASE IN POPULATION

Two facts evident to the most casual observer are that we are saving more lives than ever before in the history of the world, and that the population of the world is increasing at a rate that must reach the saturation point of population in the near future if present conditions persist. Between 1801 and 1911 the population of England and Wales was more than quadrupled.[10] Between 1800 and 1920 the population of the United States increased almost twenty fold. For the decade 1800–1810, 1,932,000 were added, while for the decade 1910–1920 the increase was 13,739,000. Canada is doubling her population every 24 years by an increase of 29.8 per thousand.[11] The population of Europe was approximately 187 million in 1800[12] and 465 million in 1916.[11] In 1800 there were approximately 850 million people in the world against more than 1,700 million at the present. The age of man is not known, perhaps 500,000 years for Homo, and 25,000 years for Homo Sapiens. At the least it required 25,000 years to produce 850 million people, but only 100 years to double the number. At the present rate of increase, estimated at from 12 to 20 million per year, it is easy to see that the world will become overpopulated in the comparatively near future, just as it already is in certain areas, notably those inhabited by the brown races. Expert calculations show the population of the world doubles every 60 years at the present rate of increase.[13] If it were possible to maintain this rate the third generation from ourselves would see a world population of 7,000 million, or 2,000 million more than the estimated number for which the world can produce food.

Over-population leads to certain conditions which are corrective to some extent, but this does not, as a rule, take place until the conditions of life have become severe and the standards of living lowered below normal. India, for example, gained only 3,786,000 people, or 1.2 per cent, from 1911 to 1921, less than one-tenth of the annual rate of increase in European countries and in the United States. With a birth rate of 40 to 55 per 1,000, the infant death rate for 1911–1916 varied from 199 to 352 per 1,000.

FOOD SUPPLY

The food supply is already a very serious problem in many parts of the world, and will rapidly become so for the entire world if the present rate of increase in population, or anything near it, continues. It is the dominant problem of the future.

The world has 13,000 million acres of land available for cultivation, and since two and a half acres are required to produce food for one person, it is evident that the maximum population which can be supported on anything like the present standard of living is 5,200 million, a number which will be reached in slightly over a century, if present conditions continue. East draws a forceful if depressing picture of what may occur in even less time than a century—a world filled with people "without faith or hope, a seething mass of discontented humanity, struggling for mere existence." Of the surface of the earth which is land, more than one-half has a rainfall of less than twenty inches annually. Only one-fourth receives the amount best suited to agriculture, twenty to fifty inches, and a large portion of this is not available for cultivation on account of being mountainous or too cold. Of 52,000,000 square miles in the temperate and tropical zones, only 20 per cent is potentially available.[14] The Americas are the last food frontiers of the world. East holds the United States entered the era of diminishing returns in agriculture between 1890 and 1900.

Let us for a moment consider only the United States. Pearl[4] has estimated the maximum population which can be supported at 197,000,000, which will be reached about the year 2100. The food requirements will reach 260,000,000 million calories, based on our present standards. Between 1911 and 1918, the country produced 137,163,606 million calories, or a little more than half of what will be required. East puts the matter in a more practical way by saying that with our present agricultural efficiency the country can eventually support 135 million persons on the present standards. To support 200 million, our productivity must be increased by 50 per cent. Even the most optimistic estimate which has any basis in fact, fixes 331 million as the maximum population which can be supported. This takes into consideration every acre of reserve land, and supposes it to be as productive as that now cultivated. It allows for no margin of safety, for no bad years. East, who makes the calculation, believes Pearl's estimate of approximately 200,000,000 nearer to the truth. Yet only a short time ago Lloyd George was talking of the time when the United States would have a population of one billion, 500 million, and Canada 500 million!

It is not too much to say that the necessity of a food supply has been the underlying cause of all wars between nations. Some may object to this statement and hold that the prizes at stake have been territory, gold, prestige, "a place in the sun," power, coal and oil, or other things, and while we may admit the truth of their contention as to the immediate exciting motives, deeper analysis will show that after all food has been and is the great problem of the animate universe. Civilization, as we have it at the present, is constantly tending to foster the increase of population at a greater rate than would have taken place under natural conditions. Civilization has constantly tended "to throw off the yoke of natural selection," and to do away with the winnowing and sifting processes provided by nature.

Small wonder that economists and biologists have taken the dusty copies of Malthus' Essay from their shelves, and are now proclaiming him a prophet born out of time. The simplest statement of his thesis: "Population tends to increase by geometric progression, means of subsistence by arithmetic progression" expresses the grave problem which man must answer in the near future. "The pressure of population on the means of subsistence" must constantly increase.

QUALITY VS. QUANTITY

More important than mere numbers is the quality of the population, and here civilized man is in the unfortunate position of knowing what course should be followed, but of being so hedged in by customs, bound down by sentiment, swayed by emotion and controlled by religion that his knowledge is of little practical effect, either in improving the race by selective mating, or in preventing deterioration through the mating of the unfit, or by their elimination. Pearson says "The conception of the destruction of the less fit as a beneficent factor of human growth must become a part of our mental atmosphere; we must look upon it as a chief cause of the mental and physical growth of mankind in the past, not as a blind and hostile natural force carelessly crushing the single life, but as the source of all that we value in the intellect and physique of the highest type of mankind to-day," and we may well ask what would man be to-day if natural selection in the past had been held in abeyance to the same extent as it is at present.

The saving of babies doomed to death under conditions as they existed only a short time ago is frequently cited as an example of saving the unfit to propagate their kind, and a compensatory death rate in early adult life has been predicted, but the fact is that the mortality rate has improved at all ages except the advanced.

There does not seem to be any doubt that infant mortality is selective, but there is just as little doubt that a certain number of these weaklings are among those we can ill afford to lose. Both Sir Isaac Newton and Goethe were feeble infants, whose deaths might have been considered desirable for the good of the race. The death of infants is an economic waste affecting the weak and the strong, the good and the bad, though not with equal force. No one knows how to make a selection. "We do not know enough to nip unpromising buds," but even so we must not forget the proven fact that it is more important to care for good stocks than for very exceptional members of poor stocks.

INHERITANCE OF ABILITY

Galton, belonging himself to a family notable for men of high intellect, showed conclusively that mental ability is inherited. Every objection which might be raised, such as the unusual advantages enjoyed by certain families in environment, education, etc., has been carefully considered and excluded to the extent that it can be said positively that practically all students of the question recognize the predominant influence of inheritance in the production of mental ability above the average. Such families as the Balfours and Darwins, among others, give proof of this.

"On the originality, general ability and productiveness of Erasmus Darwin it is not necessary to comment. Robert Waring Darwin, his son, was a distinguished physician, and, like his father, a F.R.S. Another son, Charles, was a man of remarkable promise, and although he died at the age of 20, he gained the first gold medal of the Aesculapian Society for experimental research. Charles Robert Darwin, the author of the *Origin of Species*, and by common consent one of the world's greatest men of science, was the son of Robert W. Darwin. He married his cousin, Emma Wedgewood, a granddaughter of Josiah Wedgewood, F.R.S., the founder of the pottery works that produced the famous Wedgewood

ware. Charles Darwin's four sons became men of note: Francis Darwin, F.R.S., a prominent English botanist; George Darwin, F.R.S., noted astronomer, and Professor of Astronomy at Cambridge; Horace Darwin, F.R.S., a prominent engineer; Major Leonard Darwin, author of works on political economy, president of the Eugenics Education Society, and president of the International Eugenics Congress. Finally must be mentioned Francis Galton, cousin of Charles Darwin, grandson of Erasmus Darwin."[9]

Holmes goes so far as to express the opinion that "a great man has never been produced from parents of subnormal ability," and that in spite of all the aid which environment and education may give, or which may come from any other source, greatness cannot come out of mediocrity, or good ability out of inborn dullness.

MENTAL DEFECTS INHERITED

On the other hand, nothing is clearer than that many forms of mental weakness and disorder may be, and in fact are, often inherited. Goddard found only 6 of 482 feebleminded who were not feebleminded also. Tredgold's extensive studies lead him to believe that where 2 mentally defective persons mate their offspring are all defective. Another authority states that "mental defect never appears in sound stock as a mere sport," and still another says he "has yet to see a case of mental defect in which one or both parents did not show departure of some kind from the normal." Inheritable defects and tendencies lead to delinquency and crime, and thus constitute what is perhaps the gravest situation of the future.

It is very difficult to obtain a correct estimate of the mental defectives in any country, even of those in various institutions, and family pride often leads to concealment of those living at home. In some states there are laws forbidding the marriage of the feebleminded, and there is some effort made to register them, but even in those states in which registration is most completely carried out, it is conservatively estimated that it is not more than 10 per cent effective.

The late Colonel Pearce Bailey[15] from examination of recruits in the United States for the World War said: "If mental deficiency ran uniform among persons of all ages, there would be 353,210 male defectives in the United States." Doubling this number on the supposition that the male and female defectives are approximately equal in numbers, would give more than 700,000 for the country. Some 40,000, less than 6 per cent, are being cared for in institutions. Ninety-four to 95 per cent of these unfortunates are presumably at home. For January, 1925, the U. S. Department of Commerce[16] gives 46,722 as the number of feebleminded in federal, state, city, county and private institutions. The same report gives the total number of persons confined in institutions for defectives, dependents, criminals, juvenile delinquents, mentally diseased, feebleminded, epileptics, etc., as 893,679, while 78,090 paupers were in almshouses. In view of the known facts, the estimate that in the United States there are from one and one-half to two million people who are defective and need institutional care does not seem exaggerated. Fifty per cent at least of these defectives have heredity to thank for their condition, and in turn will reproduce their kind if allowed to procreate. In addition to these the draft showed that 2.7 per cent of the recruits were below the mental age of 10 years—high-grade feebleminded. On this basis, East estimates that we have "people with no sense worthy the name, defective stock, over five million; people with little sense, scrub stock, twenty million."

The inheritance of feeblemindedness is well shown in the history of the Jukes, Kallikaks, Zeros, Nams, Turckers, the Tribe of Ishmael, the Hill folk, the Garlands and others. Two of these are of

especial interest since in both there is a normal and an illegitimate strain springing from a common male progenitor, in effect an elaborate experiment in eugenics.

The Kallikaks—Sprung from Martin Kallikak, a normal man, and soldier of the American Revolution. By a feebleminded girl he had a feebleminded son, Martin Kallikak, Jr., who married a normal woman by whom he had 7 children, 5 of whom were feebleminded, and 2 normal. Of the descendants 480 have been traced, of whom 143 were feebleminded, 46 normal, and 291 of unknown mentality. Thirty-six were illegitimate, 33 sexually immoral—mostly prostitutes —24 alcoholics, 3 epileptics, 3 criminals, 8 brothel keepers, while 82 died in infancy. These people married into other families, mostly of their own kind, and from these unions 1,146 individuals have sprung, 262 feebleminded, 197 normal and the others undetermined.

After the Revolution Martin Kallikak, Sr., married a respectable woman of normal mentality, by whom he had several normal children, all of whom married into the best families of their state, among whom are found colonial governors, signers of the Declaration of Independence, and founders of a great university. Their descendants are respectable and prominent citizens, doctors, lawyers, judges, soldiers and educators. Of 496 descendants, all were normal and respectable citizens, except 3 men, 2 of whom were alcoholics and one sexually immoral. They have scattered widely and are prominent in every community in which they have settled, having produced no feebleminded, no illegitimate children and no immoral women.

The Garland Family—The progenitor had an illegitimate child by a mentally defective woman, but later married a normal woman. Among 437 descendants of the subnormal woman, 130 were classed as feebleminded, while among 496 descendants of the normal woman, none were so classified.

The Jukes Family—This family was one of the first to be carefully studied. In an investigation of penal institutions of New York the frequent occurrence of a certain name attracted the attention of Mr. Dugdale, who was led to make the first study of the family in 1874. Dr. Estabrook, of the Eugenics Record Office, made a later study and brought the record down to 1915. The progenitor was Max Juke, born between 1720 and 1740, in Ulster County, New York, where the descendants lived until 1880, but who had spread to fourteen states in 1915, and of whom 1,258 were known to be living.

Taking into consideration only the descendants of the 5 original Juke sisters, 2,094 persons have been traced. Among these, 170 were paupers, 129 had received outdoor relief, 778 were criminals (80 habitual thieves, 10 murderers), 378 were prostitutes, 86 kept brothels, 181 were intemperate, and "one-half were and are feebleminded, mentally incapable of responding normally to the expectations of society." The criminals in the family were all, as far as could be traced, defective mentally. Among those of the family living in 1915, of the boys over nineteen years of age, and the girls over fifteen, 65 were good citizens, 255 fair, 305 antisocial, 51 were and 82 had been prostitutes, 41 were criminals, 83 intemperate, 152 industrious and 103 mentally deficient. The cost of this family to the community has been estimated at $2,516,685.00.

The Jonathan Edwards Family—The record of this family is often given in contrast for the purpose of emphasizing the importance of heredity. The number of descendants whose history is known is 1,394, among whom are 295 college graduates, 12 college presidents, 65 professors, 100 clergymen, 100 musicians, 100 lawyers, 80 public officials, 75 army and navy officers, 60 physicians, 60 authors, 30 judges, 3 U. S. Senators, a Vice-President and no known criminals.

FECUNDITY OF THE SUB-NORMAL

It is generally believed that the feebleminded are more fertile than normal persons. Statements have been made that they are a vigorous and highly fertile stock, that they are oversexed, that the women have double the number of children that normal women have, and even more exaggerated claims have been put forward. There are unquestionably certain cases which might be cited to prove

TABLE II

AVERAGE NUMBER OF SIBLINGS OF THE CASES IN EACH INTELLIGENCE CLASSIFICATION[17]

Intelligence Category	No. of Clinic Cases in Each Category	Av. No. of Children in the Families Having Cases in Each Category	Per cent of Families Having 8 or More Children
Supernormal	1	5.00	.....
Normal	42	3.38	4.76
Retarded	65	4.83	18.27
Normal and retarded	107	4.26	13.08
Backward	301	5.87	27.24
Borderline	98	5.69	28.57
Deferred	52	4.84	32.69
Morons	133	6.15	34.58
Imbeciles	97	4.57	14.43
Idiots	5	4.40	.....
All feebleminded	235	5.46	26.08
All cases	794	4.83	19.12

The ascending groups in the table represent ascending levels of intelligence, the "retarded" being less backward than the "backward." The average amount of retardation and average I.Q.'s for these categories have been given in "Problems of Subnormality" and "The Value of the Intelligence Quotient for Individual Diagnosis."

such statements. With few exceptions, careful investigations in this as in other countries have shown that matings of feebleminded and psychopathic persons produce a greater number of children than matings of normal persons. These unfortunates have no sense of responsibility for the present nor care for the future; they are not restrained by moral motives nor public opinion; the females are immodest, lack judgment and ability to resist temptation—all factors which are apt to result in greater fecundity. The marked tendency to assortative mating increases their menace. Among the Jukes the proportion of marriages was greater than among normal persons in general, and early marriages were customary. The same is true of the Kallikaks, Zeroes, Nams, and Hill folks, and may be said to be typical of similar families generally. In spite of a higher infant death rate, and of sterility from venereal disease in those who become prostitutes, there seems to be no doubt that the sub-normal are flourishing and reproducing their kind in greater numbers than normal persons. This is illustrated in Table II compiled from the records of a block of consecutive cases examined in the St. Louis Psycho-Educational Clinic. These data are unique in having been obtained from public school pupils of different social status and different levels of intelligence from normal to idiocy, and not from institutional cases belonging to a restricted social level or mental classification.

ALCOHOL

Volumes have been written in the attempt to prove that alcohol causes insanity, feeblemindedness, idiocy, epilepsy, degeneracy, etc. It cannot be questioned that these conditions and alcoholism are often associated, but no one has proved which is cause and which effect. In one of the strongest statements against alcohol it is admitted that of 350 families of alcoholics, 209 were without alcoholic ancestry that could be traced. In 141 cases the alcoholism was linked with conditions of heredity—in 106 by heredity in similars, and in 35 by heredity in dissimilars. The patients whose families were studied were "all degenerates of a low order, idiotical, incompletely developed, feeble, epileptic." In spite of this last statement, nearly 60 per cent gave no history of alcoholism. Which was cause and which effect? Heron's investigations of alcoholism in women led him to the view that "the mental defect of the inebriate is not a gradual growth; it is born not bred." Barrington and Pearson have shown that nineteen-twentieths of the mental defect antedates the alcoholism. Elderton, who with Pearson made a study of schools in Manchester and Edinburgh, says that "drink has practically no influence on the general health and intelligence of boys and girls, and the little influence it has is in favor

of the children of drinking parents; they are healthier and more intelligent." It need hardly be said that such conclusions led to a somewhat heated discussion, but every criticism was successfully answered.

These results are particularly interesting in the light of experiments on guinea pigs by Stockard, which have been going on for 13 years, and which have often been cited to prove the evil effect of alcohol. Beginning with a good strain of pigs, he mated normal males with normal females 81 times, and normal males 81 times with alcoholized females. From the normal matings he obtained 196 young, with no defectives, and a mortality during the first 3 months of 22.9 per cent. From the alcoholized mothers 185 young were born, with 6 per cent of defectives, and a mortality of 43.3 per cent during the first 3 months. The results were more striking when normal mothers were mated alternately with alcoholized fathers. From 77 normal matings 195 young were produced, with 3 failures to conceive, while 81 matings with alcoholized fathers gave 183 young, 12 per cent of failures to conceive. The mortality among the normal young was 17.4 per cent against 25.1 per cent for those from alcoholized fathers. Among 506 controls in later generations, the prenatal and postnatal mortalities were practically 50–50, while in 1,197 alcoholic progeny the prenatal was almost double the postnatal, 2 to 1 instead of 1 to 1. The mortality after correction for size of litters was proportionately 180 to 100 for normal. The actual mortality was 38 per cent against an expected mortality of 21 per cent. Offspring F_1 from directly alcoholized parents gave a mortality of 195 as against 100 for normal, or 43 per cent against 22 per cent for the controls. The prenatal mortality was $2\frac{1}{3}$ times the postnatal. Alcoholizing the parents increased the prenatal mortality about eight times more than the postnatal, 250 per cent against 30 per cent. The fourth generation from alcoholized great-great-grandparents shows a very different picture. The mortality is only 13.5 per cent against 21 per cent for the controls, or 64 against 100 for normal. The prenatal mortality is reduced to a little more than half of the postnatal, better than the normal 1 to 1 ratio. "All the weak and altered germ-cells have been eliminated and the survivors average well above the controls."

Stockard considers alcohol a selective agent which will bring out the best that is in a stock. The alcoholized stocks are not quite so prolific, but of superior vitality. In discussing the bearings of his results he points out the well-known fact that all the dominant races of men have an alcoholic history; that is, their ancestors have used alcohol and most of them spirits. He believes it to be practically impossible for human beings to be so thoroughly alcoholized as were his animals under experimental conditions. He is convinced that it is impossible to so saturate the blood with alcohol as to poison the entire cell population, and considers it highly improbable that human beings have ever injured or eliminated their normal resistant germ cells with alcohol. The prevention of physical and mental defectives lies in getting rid of the poor germ-plasm from which they arise, and the preservation of biologically good stocks. It is interesting to see how this work fits in with the investigations of Pearson and Elderton, and their findings.

The selective effect of alcohol has long been observed. The infants of alcoholic mothers die at a much higher rate than those of sober mothers. Among 125 children of 21 drunken mothers, 69, or 55.2 per cent, died during the first 2 years, while among 138 children of 28 sober mothers, 33 or 23.9 per cent died. While the care by the mother influences greatly the chance of life of the child, it is also true that alcoholism is due to a large extent to neuropathic inheritance; so it is fair to assume that a certain proportion of the deaths among the children of alcoholic mothers tends to improve the

race by eliminating those of defective inheritance.

MENTAL DEFECTIVENESS AND CRIME

The relation of mental abnormality to crime has engaged the attention of penologists for some years. The National Committee for Mental Hygiene in a study of approximately 10,000 prisoners in penal and correctional institutions found 60 per cent "classifiable in terms of deviation from average normal mental health," and considered that their mental condition had some causal relation to their antisocial conduct. In a more recent survey of county jails and penitentiaries in New York State it was found that 76.6 per cent of 1,288 inmates showed distinct mental deviation along some line.[19]

Estabrook says that not all of the feebleminded Jukes were criminals, but all those who were criminals were mentally defective, as far as studied. Various writers give the percentage of defective mentally among criminals from 20 to 45, and Holmes says that those who are sent to prison are, on the average, of subnormal mentality.

Recidivism. The tendency of criminals to repeat their offenses is well known. Of 182.000 convicted in England in 1906, 107,000, or 58 per cent, were repeaters, and 10,000, or 6 per cent, had been convicted twenty times or more. Of 152,432 committed to the Allegheny County (Pennsylvania) workhouse, 71,704 had been committed two or more times—884 more than twenty times.[17] A recent report from England (March, 1925) states that 83 per cent of the women, and 62 per cent of the men prisoners received 1923–1924, were repeaters. Of the 8,801 women, 2,886 had been convicted more than twenty times. Of 608 prisoners at Sing Sing, 66.8 per cent were repeaters. At the Texas State penitentiary, of 3,000 prisoners, 58 per cent had been arrested previously. Among the inmates of the New York County jails, 66 per cent were repeaters and 27.9 per cent had been arrested four or more times.[19]

LESSENING BIRTH RATE

In the 19th century it was observed in many countries that the birth rate was falling off. France was one of the first countries in which the decline took place and we have heard more of it in connection with France than any other country. It is now common to most civilized countries. From 1871–1876 to 1915, the number of annual births for each 1,000 women has fallen in England and Wales from 35.5 to 21.8; in Scotland from 35 to 23.9; in Ireland from 27.4 to 21.8; in France from 25.5 to 18; in Germany from 38.9 to 27.4 (1913); in Norway from 30.2 to 23.8. The United States has no birth registration figures for the entire country. Compilations by Professor Wilcox show that the number of children under 5 years of age for each 1,000 women between 16 and 44 years has decreased from 976 in 1800 to 508 in 1910; so it is certain that the United States is no exception to the general rule of declining birth rates.

Since the population of most countries continues to increase, there is no immediate cause for alarm in the decreasing birth rate, but there is a grave menace in the fact that the best stocks are not reproducing themselves in proportion to the poorer ones. Holmes and Doud have investigated the Mayflower descendants. Twenty-three of these Pilgrims are known to have left descendants, among whom we find names famous in American history. Of husbands and wives born between 1810 and 1830, the average number of children was 6, while between 1870 and 1880, it had fallen to 1.5. Allowing for possible error, they concluded that these stocks are not reproducing themselves in sufficient numbers to insure their continued existence—on the contrary, they are dying out.

The old colonial stocks of New England show the same tendency, as pointed out by the late Frederick S. Crum,[20] who

studied the genealogies of 12,722 wives. In the period 1750–1799, the families averaged 6.43 children, but declined steadily, and in 1870–1879 averaged only 2.77. Pearl [21] says that the native New England stock is passing away with considerable rapidity. Foreign born women are producing children in much greater numbers than native born, and while this may eventually affect what we call our American ideals, for the race it does not necessarily mean future danger. Indeed, there is abundant evidence that the immigrant women soon lose their marked fecundity, and fuse with the stocks already here. The real trouble lies in the all too evident fact that the mentally unfit, the uneducated and the unsuccessful are producing children at a high rate, while the educated and responsible classes are steadily having fewer children. This is shown in Table III, compiled from data given by Holmes.[9]

TABLE III

AVERAGE FAMILIES OF COLLEGE GRADUATES

Year	Children per Family	Average per Graduate	College
1851–60	3.13	1.68	Harvard
1881–90	2.06	1.55	Harvard
1851–60	3.32	2.53	Yale
1881–90	2.04	1.53	Yale
1833–40	4.49 (male)		Wesleyan
1901–10	.81 (male)		Wesleyan
1871–80	2.60 (female)		Wesleyan
1901–10	.69 (female)		Wesleyan
1803–09	5.6		Middlebury
1875–79	1.8		Middlebury
1830–39	4.0		N. Y. University
1860–69	2.5		N. Y. University
1842–49	2.77	2.37	Mt. Holyoke
1890–92	1.91	.95	Mt. Holyoke
1870–79	2.78		Vassar
1900–09	.68		Vassar
1890–99	1.71		Bryn Mawr
1900–09	.77		Bryn Mawr
1880–89	1.66		Wellesley
1890–99	1.10		Wellesley

Benjamin Franklin estimated the average number of children in the American family of his time as 7. Hoffmann found that it had dropped to 2.77 for the 1870–1879 decade. During the same period the percentage of childless wives increased from 1.81 to 8.10; mothers with only one child from 1.81 to 18; while mothers with from 6 to 9 children decreased from 50.36 to 8.57. Among scientific men the number of children per family has decreased in one generation from 4.66 to 2.22. Indeed it is placed lower than this by Cattell, who found an average of 1.88 children in 261 completed families of whom 12 per cent die before the age of marriage. He estimates that on an average a scientific man has seven-tenths of an adult son. Assuming similar rates for marriages, births and mortality before the marriage age, he sees "extermination" of these lines. Since only about 50 per cent of women college graduates marry, female lines will be exterminated still more rapidly.

Many countries in Europe show the same tendency. In 1911, for England and Wales, births per 1,000 married males under 55 years were: upper and middle class, 119; intermediate class, 132; skilled workmen, 153; intermediate class, 158; unskilled workmen, 213; and according to occupation were: medical practitioners, 103; solicitors, 100; clergymen, Church of England, 101; dock laborers, 231; earthenware makers, 181; costers and hawkers, 175.[10]

Viewed from a somewhat different angle, the same tendency is shown in a table of comparative fertility for England [12] referring to women of childbearing age, the figures based on the general population fertility represented by 100. The highest fertility is found in coal miners (126.4), agricultural laborers (113.4), boiler makers (110.1), farmers (100.5), the lowest in non-conformist clergymen (79.8), Church of England clergymen (72), teachers (70.3), and physicians (64.7).

TABLE IV

FINDINGS IN HOLLAND[22]

Poorer classes	5.4 children per family
Most prosperous class	4.3 children per family
Artists	4.3 children per family
Higher state officials	4.0 children per family
University professors	3.6 children per family
Twenty-three scientists and artists of first rank	2.6 children per family

Among the employes of the Bavarian State Railroad, the highest officials average 1.9 children, the medium 2.1, and the lower 3.4. For the German Post and Telegraph Service the respective figures are 1.7, 1.9 and 2.4.

Results closely in accord with these

have recently been announced for the United States,[23] where foremen, overseers, inspectors and coal miners lead in the number of children per family with 8.1, while physicians and dentists are lowest with 3.3. Between these extremes come bankers with 3.7, lawyers and judges with 3.6, authors, editors and reporters with 4.1. Table V gives the relative fertility of women in four large cities in four different countries, and may be taken as representative of a general trend.

TABLE V

FERTILITY OF WOMEN IN DIFFERENT DISTRICTS OF LARGE CITIES[24]

(General Population Fertility 100)

	Paris	Berlin	Vienna	London
Very poor districts...	108	157	200	147
Poor.....	95	129	164	140
Comfortable.....	72	114	155	107
Very comfortable....	65	96	153	107
Rich.....	53	63	107	87
Very rich.....	34	47	71	63

Much has been written lately about the Nordic races, and many hold that the future of the world lies in their hands. It is of interest, therefore, to glance over the history of the United States. The earlier settlers and immigrants were almost wholly Nordic, and good average representatives of their stocks. Later the immigrants who poured in were largely non-Nordic, and many thousands were from the submerged portions of the groups from which they sprung. In 1910, the rural population was between 80 and 90 per cent of Nordic stocks, against approximately 60 per cent for the urban population. There were 382 children under 5 years for every 1,000 urban women, against 603 for 1,000 rural women. In 1920 the relative number of children from urban women had risen from 382 to 392 per 1,000, while for rural women it had dropped from 603 to 581. During the first 100 years our immigrants were almost wholly Nordic stock, but the tide began to sweep from the south, and in 1914, only 18 per cent came from northern and western Europe, and 75 per cent from eastern and southeastern Europe. We have put up the bars, and have waxed a little hysterical perhaps, though there is still great pressure being brought to bear to let in cheap labor. East[11] believes that the bars should be raised higher, especially against the stocks of eastern and southeastern Europe. He states that there is real reason to believe that the highest percentage of unfitness is found in these stocks. Our experience may serve to help other countries.

Without endorsing the extreme statements made by some writers, it is evident that the classes best fitted to produce children of superior quality, to rear and to educate them, are not reproducing their kind, while those less fitted—the poorer and less educated—are doing so, and the unfit mentally and socially show a fecundity above the normal. In addition, we are losing entirely some of the best worth-while stocks through the enforced celibacy of religious orders, both male and female. It need only be mentioned that Mendel left no progeny. In view of the attractive opportunity for a career which the church has offered to men of ability, training and character, the number of such who have entered the ministry is but natural. In spite of the principle of filial regression formulated by Galton, there have been many prominent men who were the sons of clergymen, and many eminent Jews who were the sons of rabbis. Those churches which enforce celibacy take from the possibility of inheritance some valuable stocks.

This rather tiresome array of figures tells only a part of the story, all that we will have time to discuss in this paper, but the part which seems most important for us to consider. It seems quite clear that we have thrown away certain safeguards which in the past made for safety and progress. Civilization and religion have introduced problems which we have not yet learned to deal with. Constant opening up of new lands has relieved the pressure of population, inventions and the development of power have gone hand in hand to facilitate transportation and to equalize food supply, not only as regards territory, but as regards seasons, bad years, etc. Never has there been such

generally distributed abundance, never so much luxury, never such ease of living.

The great majority of people are too busy enjoying themselves and piling up wealth to give any thought to the future of the race. Here and there, chiefly among the biologists, a voice is raised, and the number is increasing. Those who have been so aptly called by Samuel Blythe "panacea people," who suffer from the "something-must-be-done-about-it" complex may be left out of consideration, as may also certain sensational writers, but sober students are entitled to a hearing.

During the past few years it has been my lot to go over a rather extensive literature, and while some writers view the trend of the race with optimism and some with misgiving, without exception all point out certain tendencies which unless corrected or in some way counteracted must lead to unhappiness, if not disaster. Professor William MacDougall [25] says: "When I see America dancing gaily with invincible optimism down the road to destruction, I seem to be contemplating the greatest tragedy in the history of mankind." It must not be forgotten that other races of men have declined and disappeared, and other civilizations have risen, flourished and then sunk into oblivion. Are we wise enough to escape the fate of those gone before? We unquestionably know enough, but whether we will make use of our knowledge is a question.

HEREDITY

The future of the race will be determined by heredity more than by any other factor. Thompson [1] has called heredity the first determinant, the first and greatest Fate. He is far from holding the damning doctrine which discounts the effects of environment and training. "It is a sad waste," he says, "when a fascinating new plant is choked in a sluggard's garden." Pearson has shown that "it is five to ten times as profitable for a child to be born of parents of sound physique and of brisk, orderly mentality, as for a child to be born and nurtured in a good physical environment," and Sir Thomas Browne has said: "Bless not thy self only that thou wert born in Athens; but among thy multiplyed acknowledgments lift up one hand unto Heaven, that thou wert born of Honest Parents, that Modesty, Humility, Patience, and Veracity lay in the same Egg, and came into the world with thee."[36]

Some are born with ten talents,[26] some with one, most of us with five. While we may not be able to increase the number of our inherited talents, we can trade with them, but cannot pass on to posterity any gains that may be acquired. There is always hope of a gain from the other parent. Some have gone too far in denying the influence of environment. Environment influences heredity in many ways. It determines to a great extent the survival of variations. Thompson calls "nurture" the second determinant of life, meaning by the word all manner of environing influences. Professor E. W. MacBride [27] has recently brought forward evidence to show that when a parent and child are both brought up under the same environment, the effect of the environment is intensified, the child beginning where the parent left off.

Siemens,[22] who cannot be considered an alarmist, believes that in the last analysis, the degeneration of any species, like the decline of any people, is due to refusal of selection. He holds that the first duty of racial hygiene to-day is to arrest the dying out of the socially higher classes, which he sees going on everywhere. Unless this is done, and the unwholesome selection which is progressively wiping out our best hereditary stocks is checked, we will go to our certain downfall. He notes that animal and plant breeders owe their success not to any ability to produce new inheritance factors, but to systematic selection, and the increasing of those hereditary stocks in which valuable inheritance factors already exist.

By others the mating of the unfit is considered the most imminent danger, and the first needing correction. The proposed remedies have gone as far as euthanasia for defectives. Prohibition of marriage has been a failure. Sterilization has been ineffective. Laws have been passed in 18 of the states of the Union sanctioning or requiring sterilization of certain types of criminals and defectives. Through vetoes, court rulings, repeals and non-enforcement, the laws have a very limited application. Though the first law was passed in 1905, up to January, 1921, only 3,233 operations had been done, 2,558 of which were in California.[17]

BIRTH CONTROL

At the present moment birth control, under various names, is more discussed than any other measure. In England it has become a burning question owing to the strong stand in favor of it taken by Lord Dawson[28] before the Birth Rate Commission, in which he not only maintains the opinion expressed by him in 1921, but goes much further. There can be no question that the movement is gaining the support of many biologists, eugenists and physicians, and not a small number of clergymen—some of the highest in the Church of England, like Dean Inge and the Bishop of Birmingham. In America there is now a bill before Congress to remove the restrictions against teaching birth control which have been in force since the days of Anthony Comstock. Under the name "Neo-Malthusianism" a widespread movement is under way, founded on the fundamentals enunciated by Malthus. As expressed by Dr. Drysdale,[29] it is "based on the principle of Malthus that poverty, disease and premature death can only be eliminated by control of reproduction, and on a recognition of the evils inseparable from prolonged abstention from marriage." It advocates early marriage with control of offspring, and holds that universal knowledge of the use of contraceptives would bring about "selection," alleviate poverty, remove other social evils, and elevate the race.

The claims made for birth control, even by some otherwise well balanced writers, are extreme. It is hailed as a panacea for the ills of humanity, and is being advocated in an indiscriminate fashion. The chief practical objection to the claims put forward seems to be that the rich and more intelligent already control the size of their families, while it is futile to attempt such control among those who most need it—the subnormal—by teaching the use of contraceptives. There is an intermediate class among whom it might gain some headway, and to whom some measure of relief might come from the economic standpoint. Any restriction which would limit the number of offspring of desirable parentage below the minimum required for perpetuation of the race is bad from every point of view, and is more apt to result in the loss of good stocks than to prevent the perpetuation of poor ones. No measure that diminishes the number of births will arrest the progressive extinction of the most desirable hereditary stocks, which is so rapidly going on in every country. Siemens holds that the preservation of these stocks is more immediately important than the prevention of increase of the inferior. The propagation of the superior stocks should be made to exceed the average.

The breeding of a superman must not be expected under any conditions. Even if we succeed in mating the best with the best, the limit is soon reached, and a mutation must arise before new material for further improvement is available.

Sir Arthur Keith[30] scouts the idea of a future man who will be all intellect. "Those who will inherit the earth will not be people predominantly intellectual, but people of robust constitution with a good deal of what is called the animal in them." However, the application of the so-called Galton-Pearson law leads us to believe that if those superior in ancestry as well as individually could be mated

only with like superiors, in a few generations a point would be reached where all the offspring would tend to be superior, and the mediocre would be eliminated. Such superiority would be maintained as long as the type of mating was kept up.

The whole matter is inextricably bound up with religious, social and economic questions which cannot be settled offhand. The Roman Catholic Church stands firmly against any interference with procreation, and holds that marriage is for the purpose of producing children. While this church has made a real success of preventing abortion among its members, and while the average number of children per family is greater in Catholics than in non-Catholics, it is to be noted that in countries in which this is the prevailing religion the birth rate has fallen just as it has in other countries. France, Italy, Belgium and Spain all have Neo-Malthusian societies. The Church of England follows fairly closely the same beliefs as the Roman Catholic, while some of its dignitaries are even more extreme in their views. Generally, all Christian churches, as well as the Jews, condemn interference with procreation. The fear that immorality would be increased by the spreading of information concerning contraceptives seems justified. "Not every woman is virtuous through virtue" said La Rochefoucauld. On the other hand, there is a demand by some conservative and earnest people that such teaching should be introduced into medical schools, and placed in the hands of the medical profession, since it is being given by those not qualified to teach, and who emphasize the emotional aspect rather than the medical.[3]

Whatever our beliefs may be concerning the validity of the texts on which the churches base their tenets concerning this matter, one may well question the wisdom of introducing a measure which is offensive to such a large proportion of church people. This would be true even if the Neo-Malthusians had a definite and feasible program, which is open to doubt. It is a question worthy of our earnest consideration, but in my judgment we do not know enough at present to justify the measures advocated by the Neo-Malthusian enthusiasts.

Our conception of public health has long since outgrown the idea of simply preventing contagious disease. All the points so far discussed have an intimate bearing on the direction which our efforts should take for the future, and on the estimation of the value of what we have done in the past.

In the early days when man had to contend with wild animals without efficient weapons and without any natural means of defense, it was necessary for him to be quick and resourceful. The one who did not show something of these qualities was eliminated, the earliest example of "the quick or the dead." Even to-day the savage cannot afford to be a fool, but among the civilized the fool-killer has been repressed. Early man developed through natural selection, but when he reached civilization he "suspended the racial purgation" of that process, and as knowledge has grown, he has gotten further and further away from it. The wonderful advances of medical science, the enormous sums given to charitable organizations and a multitude of protective laws have all tended to further reduce the beneficial purgation. What price has man paid? Galton says that "man is far more weakly through congenital imperfection than any other species of animal, wild or domestic." Naturalists point out the vigor, absence of fatigue, comparative freedom from parasites and freedom from senility as characteristic of wild animals, all in contrast to conditions which are the rule for civilized man. Nature had little regard for the individual, but was careful of the species. Cresson[32] said: "Everything for the species; everything by the individual; nothing for the individual." We have reversed this for man and are careful of the individual at the expense of the species. Herbert Spencer saw the danger years ago and expressed it in clear

language: "The law that each creature shall take the benefits or evils of its own nature has been the law under which life has evolved so far. Any arrangements which, in any considerable degree, prevent superiority from profiting by the rewards of superiority, or shield inferiority from the evils it entails—any arrangements which tend to make it as well to be inferior as to be superior, are arrangements diametrically opposed to the progress of organization and the reaching of a higher life."

Man presents himself to us as an animal from the biological standpoint, and for this man there must be one form of consideration and treatment. Man also presents himself to us as a social animal, and for this man there must be another form of consideration and another treatment. Biological facts are not governed by sentiment and are for the most part brutal. Sociological facts are greatly influenced by sentiment, and are largely humanitarian. The two points of view are not entirely at variance one with the other. Since the time of Christ the humanitarian side has been ascendant, at least potentially. It was realized with the work of Chadwick, and made splendidly efficient by Pasteur. The task before us now is to coördinate the two points of view. At present, inferiority is at a premium. The world is filled with schools and homes for the feebleminded and sub-normal, with hospitals and clinics, almshouses, colonies and correctional institutions. Far be it from me to advise the abandonment of these unfortunates, but it is wisdom as well as charity to see that the production of such people is checked. The fact remains that public moneys are now spent largely on incompetents and derelicts rather than for the encouragement of the ambitious and industrious.

The feminist movement is taking many of the most capable women out of reproductive family life. Economic success sterilizes women even more than it does men, and one writer [33] foresees "the entire extinction of British and American intelligence within the next two or three generations," if the movement reaches full fruition. The extremeness of this statement should not blind us to the truth on which it is founded. The stress of modern industrial life would tend to purgation by the elimination of the deficient mentally and physically, were it not for the manifold provisions made for their protection. On the other hand, the lessened fecundity of capable and sucessful women probably more than counteracts any possible beneficial effects. Only about 50 per cent of college women marry at all, and these later in life than non-college graduates. The same tendency is seen among men in the teaching profession. They marry late and restrict their families to the number they can rear and educate properly. To this extent education exerts a dysgenic effect. Of two groups of equal size, one marrying early and producing a generation every 25 years, the other marrying late, and producing a generation every $33\,{}^{1}/_{3}$ years, the former will outnumber the latter two to one at the end of a century. This is actually taking place in certain groups in the United States. It is supposed that the groups contain equal numbers of male and female, that all marry and all couples produce four children. Holmes, who is more optimistic than many, and who is unable to discover "any positive proof of decadence" admits that those forces which have been called into action through the development of our culture are largely destructive of the race. Those factors which are still operating in the direction of racial improvement are the primitive evolutionary factors which we still possess in common with the lower animals.

How long will we continue on our present course, blind apparently to the lessons of history? Scarcely a day passes without the news of some new great philanthropy or some new movement, all of which in one way or another are directed toward the saving of life. The

League of Nations through its Medical Section is busily engaged in extending the blessings of modern medicine to all the world. A modern medical school has been planted in China, already greatly overpopulated. We cannot but expect that the mortality of childbirth and of infancy will be lowered, the two factors which must tend especially to increase of population, other things being equal. The inevitable result must be a greater pressure on the food supply, which cannot be increased indefinitely even by the well trained agricultural missionaries now being sent to some overcrowded countries. East says that every one of the important plant foods on which we depend to-day was discovered and brought into cultivation by prehistoric man. Modern man has increased production, but added nothing new.

In olden times we have the story of Abraham and Lot whose flocks and herds increased beyond the power of the soil to supply food for them. The herdsmen fought, but Abraham and Lot on account of being kinsmen agreed to separate. We have grown beyond the point of allowing a mere matter of kinship to interfere with our material prosperity or our belligerency. Wars will break out in the future just as they have in the past, unless man rapidly changes his nature. Since we are what we are through the moral and intellectual qualities formed and fixed in prehistoric times, and handed down to us, there is no basis on which we can found a reasonable hope of such a revolutionary transformation.

Our humanitarian instincts and practices will probably diminish as the food supply diminishes, and in direct proportion to the scarcity of food. Whitman spoke of our being "stuccoed all over with quadrupeds," and Tennyson of the ape and tiger in us.* The vestigial remains of our ancestry which we carry on our bodies are not as important for the future as what remains of the beast in our souls. Conklin[34] says that many members of civilized society are still savages intellectually and morally, and man has outdone the brutes in brutality and the beasts in bestiality. Thompson says: . . . "no wild animal is ever so cruel, so lascivious, so selfish, so perverted, so unhealthy as man sometimes is." The point is that our philanthropy is scarcely skin-deep and will wear off readily when the rub comes. The rub will come with scarcity of food due to overpopulation. Necessity often determines customs as well as morals. Killing the old, destruction of female babies, exposure of infants, human sacrifice and other equally horrible practices have had the sanction of people, some of whom were far removed from the savage state. Living too close to the margin of subsistence may account for some of the inhuman practices mentioned.

There are some well-informed men who do not feel alarmed at the idea of overpopulation and food shortage, believing that nature will take care of these matters. Thompson recalls that in England while men were discussing means to control population, in 1877 the tide turned, and England began to show a declining birth rate—perhaps due in part to the agitation. Nature can be trusted to take care of the situation, in her own way—a way which has been condemned by men from Aristotle to Darwin as wasteful and cruel.

It need only be added that famine has stalked abroad several times within the past few years, and at this moment is threatening in parts of Ireland.

The position of the critic who has no remedy for the condition criticized is not an enviable one. The complexity of the problems forbid offhand and cocksure opinions. None of the remedies so far proposed by enthusiasts appear to cover the ground, probably no single one ever can do so. Time will add to our knowledge, let us hope, before it is too late. In

* . . . "Arise and fly
The reeling Faun, the sensual feast;
Move upward, working out the beast,
And let the ape and tiger die."
In Memoriam, CXVIII.

the meantime we are developing somewhat higher altruistic virtues at the expense of efficiency and racial welfare. Certain things are so self-evident that argument is not required to sustain their truth. On the one hand, with our knowledge of the inheritance of mental deficiency we can say positively that people showing this defect should not be allowed to procreate their kind. The dread inheritance can be stopped only by such a measure. I am aware of the cutting terms in which Huxley refers to those who urge doing away with the unfit, and doubtless there is much truth in what he said about the probable unfitness of many who propose such measures. However, when we remember that the majority of criminals are sub-normal, and that they tend to recidivism; when we know that a large percentage of those placed in asylums for the insane are released and recommitted, some of them many times, we can urge that these people should be prevented from procreating their kind without being considered unduly arrogant. We are told that we must forgive our offending brother seven times, and even seventy times seven times, but this surely does not mean that the habitual criminal whose many offenses are often due to his being the bearer of a "deadly deteriorative character" for which he is not responsible, and which can be gotten rid of only by cutting off the bearer, shall enjoy the same privileges as those who are normal. The first and most important step, it seems to me, and one which is well within our power, is to break this "dread inheritance." Can anyone who has seen Millet's picture and read Markham's poem on it,[35]* doubt the wisdom of such a measure and the duty of doing it?

On the other hand, we know what can be done by proper mating. We produce plants, animals, birds and fish of superior strains practically at will. Even savage nations have selected persons of superior physical qualifications as the parents for their tribes and have sterilized the inferior.

The difficulties inherent in the application of our knowledge to man have been pointed out. They will certainly not be overcome until necessity rules the day. However, we already have the knowledge necessary to improve conditions and to make the race of the future a better one than that existing to-day. Too strict application of scientific knowledge to the case, even if it becomes possible, has its drawbacks. Biologists recognize the value of love in the world. Lord Dawson holds that sex love has a purpose of its own in life apart from procreation, and is essential to health and happiness in married life. "If we lose the chivalry and tenderness of lovers, the joyousness of the springtime of the heart, the adventurousness of early marriage, and the delight of having children while we are young, we are missing the fragrant flowers of life."

May those of us who fear death and desire long life find consolation in the thought that too great longevity might carry harm for the race, might result in procreation after the vigor of life had passed, and when the stress of living had so impaired the powers of the parents that they could no longer give their offspring a favorable start in life. May we be able to comfort ourselves by recalling that Goethe speaks of death as nature's device for securing an abundance of life.

"O teach us to number our days: that we may apply our hearts unto wisdom."

*Who made him dead to rapture and despair,
A thing that grieves not and that never hopes,
Stolid and stunned, a brother to the ox?
* * * * * * *
Is this the Thing the Lord God made and gave
To have dominion over sea and land?
Down all the stretch of Hell to its last gulf
There is no shape more terrible than this—
* * * * * * *
More filled with signs and portents for the soul—
More fraught with danger to the universe.

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Supplement to

AMERICAN JOURNAL OF PUBLIC HEALTH

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REQUIREMENTS FOR PUBLIC HEALTH DEGREES IN THE UNITED STATES AND CANADA

A Statistical Report of 1926 from the Committee on Training and Personnel of the American Public Health Association

AMERICAN PUBLIC HEALTH ASSOCIATION

370 SEVENTH AVENUE, NEW YORK CITY

REQUIREMENTS FOR PUBLIC HEALTH DEGREES IN THE UNITED STATES AND CANADA*

FOR THE INFORMATION of members of this Association and as a basis for its own further work the Committee on Training and Personnel has collected and herewith presents data concerning the requirements for the degrees in public health in the various schools of North America granting public health degrees in 1926.

The following procedure was followed in collecting these data. A letter was written to each school on our list as giving public health degrees; and each school not already represented upon the committee was asked to appoint a member of its faculty who would serve as an advisory member to the committee. Following this a letter was sent to the approved representative of each school asking him to supply the information desired concerning his school and to give us the name of any additional schools which give public health degrees, should he know of any not already upon our list. From letters written by these representatives and from the catalogs of the respective schools the following data were prepared and sent to the various representatives for their inspection and approval. The committee desires to express its appreciation to George Donald Cummings, S.B., of the Massachusetts Institute of Technology, who did much of the detailed work in the preparation of these data.

The various degrees are described in order beginning with the Bachelor's degree and with the schools giving each degree arranged in alphabetical order.

*A Statistical Report of 1926 from the Committee on Training and Personnel of the American Public Health Association.

BACHELOR OR BACHELOR OF SCIENCE IN PUBLIC HEALTH—B.P.H. OR B.S. IN P.H.

I. *Massachusetts Institute of Technology*—Department of Biology and Public Health—Bachelor of Science in Public Health

A. Admission requirements

1. Students admitted directly from high school with college requirements including plane and solid geometry; algebra; trigonometry; physics; and chemistry; and the usual non-science subjects.
2. College transfers

B. Requirements for degree

1. Thesis
2. Completion of following course of study:

Course	Class Hours
Chemistry (General; analytical; organic; physical)	510
Drawing (Mechanical and machine; Descriptive Geometry)	90
Economics (Political Economy; Accounting)	90
English and History	180
General Studies	120
Mathematics (Calculus)	135
Military Science	180
Physics (Mechanics; Light; Heat; Electricity)	240
Physical Training	30
General Biology	75
Sources of Food Supply	30
Chemical Theory	30
Botany and Zoology	120
Anatomy and Histology	240
Bacteriology	165
Physiology	120
Chemistry of Foods	75
Microscopy of Waters	15
Water Supplies	45
Personal Hygiene and Nutrition	30
Municipal Sanitation	60
Biochemistry	120
Biological Colloquium	30
Industrial Hygiene	60
Infection and Immunity	45
Industrial Microbiology	75
Public Health Laboratory Methods	135
Public Health Administration (Including communicable diseases)	60
Public Health Surveys	15
Parasitology	30
Theoretical Biology	30
Vital Statistics	30
Thesis	240
Total	3,245

Courses offered in the Harvard School of Public Health are also available to Technology students.

II. *University of Minnesota*—Bachelor of Science in Public Health

A. Admission requirements

1. Graduation from an approved high school

B. Requirements for degree

1. Completion of the following course of study:

FIRST AND SECOND YEARS

Course	Credits
Freshman English, or English A–B–C	15
General Survey of English Literature. Rhetoric 1–2–3	9
Language (If not already taken)	0–20
The modern World. History 1–2 or 2–3	10
General Zoology. Animal Biology 1–2 or 5–6–7	10–12
Introduction to Sociology. Sociology 1	5
General Psychology. Psychology 1–2	6
American National Government. Political Science 1	5
General Inorganic Chemistry. Chemistry 1–2–3 or 4–5	12–8
General Bacteriology. Bacteriology 51	5
Elementary Anatomy. Anatomy 3	4
Human Physiology. Physiology 4 or 58–59	5–8
Elements of Mechanics and Sounds. Physics 1–2*	4
Heat. Physics 21–22*	4
Magnetism and Electricity. Physics 41–42*	4
Introduction to Economics. Economics 1–2†	10

* Required for Sequence 1. † Required for Sequence 2.

SEQUENCE 1. PUBLIC HEALTH LABORATORY OR SANITARY WORK

Qualitative Chemical Analysis. Chemistry 11	4
Quantitative Analysis. Chemistry 27	4
Elementary Organic Chemistry. Chemistry 31–32	8
Special Bacteriology. Bacteriology 101	4
Course in Immunity. Bacteriology 116	3
Physiological Chemistry. Physiology 57–58	4
Water Supply and Sewerage. Civil Engineering 162	3
Animal Parasites. Animal Biology 44	3
Insects and Disease. Animal Biology 45	3
Elementary Pathology. Pathology 1—Medical School	2
Elementary Symptomatology. Medicine 1—Medical School	2
Preventive Medicine and Public Health 53, 73, 102, 103, 107, 200	29
Electives to complete a total of 180 credits for the four years	

SEQUENCE 2. LEADING TO SERVICE IN PUBLIC HEALTH ORGANIZATIONS

Psychology Applied to Daily Life. Psychology 3	3
Municipal Government. Political Science 11	5
Introduction to Administration. Political Science 130	3
Social Statistics. Sociology 45	5
Occurrence of the Socially Inadequate. Sociology 51	3
Elementary Case Work. Sociology 52	3
Community Organization and Social Work in Small Towns and Country. Sociology 110	2
Principles of Administration Applied to Social Work. Sociology 128	2
Special Bacteriology. Bacteriology 101	4
Immunity. Bacteriology 116	3
Elementary Pathology. Pathology 1	2
Elementary Symptomatology. Medicine 1	2
Preventive Medicine and Public Health 53, 58, 59, 60, 61, 73, 106, 107, 200	20
Elementary Field Work. Sociology 90	6
Electives to complete a total of 180 credits for the four years	

III. *University of Georgia*—Medical Department—Bachelor of Public Health

A. Admission requirements

1. Same as for the medical school

B. Requirements for degree

1. At least one year's work on an approved program
2. Physicians with six weeks of intensive training in the School of Public Health, and completing a satisfactory program of city, county or state public health work under the supervision of the Director of the School of Public Health and the Commissioner of Health of the State of Georgia, are granted this degree after passing satisfactory examination.
3. Regular courses in which the candidate may register include the following which are courses of study for medical students:

Course	Class Hours
First year—Personal Hygiene	63
Second year—Public Health Laboratory Methods	66
Third year—Public Health Administration	103
Fourth year—Public Health Field Work and Thesis	66
Total	298

BACHELOR OF ARTS IN PUBLIC HEALTH

A.B. IN P.H.

I. *University of California*—College of Letters and Science—Bachelor of Arts in Public Health

A. Admission requirements

1. High school graduation. Conditions the same as for A.B. degree in other departments

B. Requirements for degree

1. Junior certificate in the College of Letters and Science

2. Reading knowledge of French or German

3. Completion of the following course of study:

Course	Class Hour Units
General Bacteriology and Microbiology. Bacteriology 1	4
General Chemistry. Chemistry 1A–1B	5–5
Organic Chemistry. Chemistry 8	3
General Physics Lectures. Physics 2A–2B	3–3
General Zoölogy. Zoölogy 1A–1B	5–4
General Human Anatomy. Anatomy 102	3
Microörganisms in their Relation to Disease. Bacteriology 101A	8
Biochemistry Lectures. Biochemistry 103	5
Human Physiology. Physiology 101	8
Field Service in Public Health Agency. Hygiene 100	5

Elective courses to complete the Bachelor's requirements, which may be selected from the following list:

Course	Class Hour Units
Biochemistry Laboratory. Biochemistry 104	4
Biochemistry. Biochemistry 110	3–5
Principles of Water Supply, Sewage, Municipal Waste Engineering. Civil Engineering 124	3
Plumbing, Heating, Ventilating, Lighting. Civil Engineering 125	2
Sanitary Engineering Laboratory. Civil Engineering 128	3
Control of Poverty. Economics 180	3
Care of Dependents. Economics 181	3
Introduction to Field Work for Social Studies. Economics 185	1
Elementary Statistics. Education 114	2
Medical Parasitology. Entomology 126	4
Food Economics. Household Science 100	4
Food Analysis. Household Science 101	4
Laboratory Methods in Metabolism. Household Science 106	4
Human Nutrition and Dietetics. Household Science 120A–120B	4–4
Child Hygiene. Hygiene 101A–101B	6
Health Education. Hygiene 147A–147B	4
Public Health Administration. Hygiene 104	4
Vital Statistics. Hygiene 105	3
Industrial Hygiene. Hygiene 106	2
Advanced Epidemiology. Hygiene 107	4
Public Health Laboratory. Hygiene 108A–108B	4–4
Physiological Hygiene. Physical Education 140	3
Municipal Administration. Political Science 163	3
Introduction to Psychological Measurements and the Use of Statistics. Psychology 107A	3
Clinical Psychology. Psychology 166A–166B	2–2
Abnormal Psychology. Psychology 168	3
Protozoölogy Laboratory. Zoölogy 110, 110C	2–2
General Parasitology. Zoölogy 111	4

MASTER OR MASTER OF SCIENCE IN PUBLIC HEALTH—M.P.H. OR M.S. IN P.H.

I. *Columbia University*—Institute of Public Health—Master of Science in Public Health

A. Admission requirements

1. Graduates of a Class A medical school with an M.D. degree, *or*
2. Graduates in arts or science having a degree of B.S. or B.A., or equivalent, and presenting evidence of having completed satisfactory courses in mathematics, chemistry, physics, and bacteriology or general biology

B. Requirements for degree

1. Completion of the following course of study:

Course
Vital Statistics
Public Health Laboratory
Public Health Administration
Public Health Engineering
Epidemiology
Industrial Hygiene or Industrial Physiology
Field Studies in Administration, Laboratory, School or Industrial Hygiene, or other specialized health subjects

As further elective requirements, a candidate will be expected to take more advanced work in one of the required subjects or else complete the requirements in one of the following:

Course
Chemistry of Food and Nutrition
Food Analysis
Tropical Medicine
Industrial Psychology
or other electives

The hours devoted to these courses were not indicated in the returned list of requirements.

It will be expected that the selection of the summer work in this field, and the subject of the thesis will be related to the advanced course or option selected.

II. *Harvard School of Public Health*—Master of Public Health

A. Admission requirements

1. M.D. degree or its equivalent from an approved medical school

B. Requirements for degree

1. One year's work (academic year) in residence. The student is required to present a program of advanced study covering one year's work, to be approved by the Committee on Higher Degrees. (List of courses from which the program may be made up will be found

under the requirements for the Dr.P.H.)

2. Final examination. On completion of a year's study, an oral examination will be given to test the student's broad acquaintance with the field of public health. Subjects covered in the oral examination are physiology, hygiene, medical zoölogy, bacteriology, vital statistics, sanitary engineering, public health administration, and epidemiology.

In addition, other courses in other schools of the university are recommended. Also those courses at Massachusetts Institute of Technology in the Department of Biology and Public Health are offered, and special work in the clinics, laboratories, and in the field (field work) is available.

III. *Massachusetts Institute of Technology*—Department of Biology and Public Health—Master of Science in Public Health

A. Admission requirements
1. Degree of S.B. in P.H.

B. Requirements for degree
1. One full year of approved study and research
2. Completion of a course of study to be selected from the following list and from certain of the undergraduate courses (for graduates of other institutions):

Course	Class Hours
Research	..
Industrial Microbiology 737	75
Cytology 713	15
History of Biology 714	30
Health Education 7601, 7602	90
Zymology 739	15
Epidemiology 739	30
Selected Topics in Biochemistry 7821, 7822	30
Physiological Basis of Nutrition 725	20
Health Hazards in Special Industries 765	15
Parasitology 709	15
Advanced Bacteriology 7321, 7322	45
Public Health Problems 764	30
Public Health Field Work 763	30
Health Education and Administration 761	15
Health Surveys and Statistics 762	45
Pathology	90
Anatomy and Histology 711, 712	240
Bacteriology 7301, 7302	165
Biochemistry 780	225
Food Fishes 7421, 7422	135
Industrial Microbiology 7361, 7362	60
Industrial Hygiene 752	60
Infection and Immunity 750	45
Municipal Sanitation 757	60
Parasitology 708	30
Physiology 720	120
Public Health Administration 7541, 7542	60
Public Health Laboratory Methods 7551, 7552	135
Public Health Surveys 756	15
Technology of Fishery Products 7441, 7442	105
Technology of Food Products 7711, 7712	105
Theoretical Biology 703	30
Vital Statistics 758	30

Courses offered in the Harvard School of Public Health are also available to Technology students.

IV. *Ohio State University*—College of Medicine—Master of Science in Public Health

A. Admission requirements
1. M.D. degree or
2. A.B. or its equivalent from an acceptable institution in which the following subjects were passed satisfactorily: chemistry, general and qualitative, 15 hours; physics, 10 hours; zoölogy, elementary, 10 hours; comparative anatomy, vertebrate, 5 hours; physiology, 10 hours; bacteriology, general and pathogenic, 11 hours. (These hours are semester hours.)

B. Requirements for degree
1. One year of resident work
2. Thesis
3. Completion of the following course of study:

Course	Class Hours
Public Health Problems 802	44
Communicable Diseases 809	44
Public Health Laboratory 813	99
Sanitary Engineering 602	55
Personal Hygiene 801	33
Industrial Hygiene 803	55
Social Service and Public Health Nursing 808	22
Water Supply Engineering 703	44
Public Health Laboratory 814	99
Demography 807	22
Medical Aspects of Public Health Engineering 817	22
Public Health Laboratory 815	99
Major Research 816	198

V. *University of Georgia*—Medical Department—Master of Public Health

A. Admission requirements
1. B.P.H. degree or its equivalent

B. Requirements for degree
1. One year of advanced work wholly or partially in the school
2. M.D. degree, with six weeks of intensive training in the School of Public Health, and completing a satisfactory program of city, county or state public health work under the supervision of the Director of the School of Public Health and the Commissioner of Health of the State of Georgia. (Courses of study will be found under the discussion of the B.P.H. degree.)

VI. *University of Michigan*—Graduate School—Master of Science in Public Health

A. Admission requirements
1. Same as for the Dr.P.H. degree without the language requirement

B. Requirements for degree
1. One year of resident work and three months field work
2. The course of study is the same as for

the first year of the Dr.P.H. degree. (See description of Dr.P.H. degree.)

3. Regular course examinations must be passed and a final oral may be required.

VII. *University of Minnesota*—Graduate School—Master of Science in Public Health

A. Admission requirements

1. B.A. degree from an approved college with basic courses in chemistry, biology, bacteriology and hygiene

B. Requirements for degree

1. At least one year of resident work
2. Thesis
3. A reading knowledge of French or German
4. Completion of the following course of study:
   a. A minimum of 27 graduate credits (grade A or B) in preventive medicine and public health
   b. A minimum of 9 graduate credits (grade A or B) in approved minor department, for example, bacteriology, parasitology, education
5. Written examination in the major subject and an oral examination in major and minor subjects

VIII. *Yale University* (Since these data were compiled a new announcement from Yale describes the Master of Science degree in Bacteriology, Pathology, and Public Health.)

MASTER OF ARTS IN PUBLIC HEALTH
A.M. IN P.H.

I. *University of California*—Graduate School—Master of Arts in Public Health

A. Admission requirements

1. Graduation from an institution on the accepted list

B. Requirements for degree

1. Completion of the following course of study:
   a. Twelve units chosen from the list of courses under the degree of A.B. in P.H., in addition to the thirty-one units of major courses required for the Bachelor's degree
   b. Eight additional units of strictly graduate work including the thesis

CERTIFICATE IN PUBLIC HEALTH

I. *Harvard School of Public Health*—Certificate in Public Health

A. Admission requirements

1. Holders of a Bachelor's degree plus the first two years in an approved medical school, and evidence of having had satisfactory training in modern languages; inorganic, organic and biochemistry; biology; physiology; anatomy; histology; pathology; and bacteriology

B. Requirements for degree

1. Completion of an approved program during one academic year in the School of Public Health. (For list of subjects open to students see the Dr.P.H. degree.)

II. *Johns Hopkins School of Hygiene and Public Health*—Certificate in Public Health

A. Admission requirements

1. Graduates of approved medical school, or
2. Graduates of approved arts or science schools who have had previous training in the physical or medical sciences, or
3. Qualified public health officers may be candidates for the degree

B. Requirements for degree

1. One year of resident work
2. Completion of the following course of study:

Course
Bacteriology
Sanitary Engineering
Statistics and Epidemiology
Other courses as may be approved by the Faculty
Further elective courses which may be selected from the list included under Dr.P.H. degree

III. *Yale University*—Graduate School—Certificate in Public Health

A. Admission requirements

1. Bachelor's degree from a reputable college or technical school, or
2. Completion of two years' work in a reputable medical school

B. Requirements for degree

1. At least one year of resident work
2. Thesis
3. Completion of the following course of study:

Course	Class Hours
Principles of Public Health. P.H. 101a.....	90
Principles of Vital Statistics. P.H. 102a.....	60
Elements of Sanitary Engineering. P.H. 107a..	90
Public Health Administration. P.H. 114b.....	60
Public Health Bacteriology. P.H. 112b.....	90
Six hours weekly of elective subjects in Bacteriology or Public Health or from recommended electives or other approved courses	

IV. *Massachusetts Institute of Technology*—Department of Biology and Public Health—Certificate in Public Health

A. Admission requirements

1. M.D. degree from recognized medical school, or

2. Bachelor's degree from a recognized school, with training in the fundamental sciences, or
3. Two years' work in a Class A medical school preceded by the collegiate training demanded for such schools

B. Requirements for degree

1. At least one year of resident work
2. Completion of the following course of study:

Course	Class Hours
Sanitary Science	30
Personal Hygiene	30
Bacteriology of Water and Foods 7301, 7302	165
Industrial Hygiene 752	60
Parasitology 708	30
Epidemiology 739	30
Infection and Immunity 750	45
Public Health Laboratory Methods 7551, 7552	135
Pathology*	90
Anatomy and Histology 711, 712*	240
Physiology 720*	120
Communicable Diseases*	
Municipal Sanitation or Sanitary Engineering	
Public Health Administration	
Further prescribed electives which may be selected from the list included under the M.S. in P.H. Degree	

* If the student has not previously had these courses

Courses offered in the Harvard School of Public Health are also available to Technology students.

3. Preparation of a sanitary survey or thesis

V. *University of Pennsylvania*—School of Hygiene and Public Health—Certificate of Certified Sanitarian

A. Admission requirements

1. Holder of the M.D. degree, or
2. Holders of a Bachelor's degree

B. Requirements for degree

1. At least one year of resident work
2. Completion of the course of study assigned to the first year of the Dr.P.H. degree (Course of study under the Doctor of Public Health degree.)

DOCTOR OR DOCTORATE OF PUBLIC HEALTH DR.P.H.

I. *Detroit College of Medicine and Surgery*—Doctor of Public Health

A. Admission requirements

1. Two years of prescribed pre-medical collegiate education and the M.D. degree

B. Requirements for degree

1. Two years of resident work
2. Completion of the following course of study:

Course
Clinical Work
Laboratory work
a. Milk Analysis
b. Water Analysis
c. Alcohol
d. Food
e. Bacteriology
f. Advanced Bacteriology
Sanitary Engineering
a. Municipal Sanitation
b. Water Supply
c. Sewage Disposal
d. Ventilation
Field Work
a. School, milk and meat inspection
b. Fumigation and Disinfection
c. Vaccinations
d. A Study of Vital Statistics of the Board of Health
e. Attendance at various clinics

II. *Harvard School of Public Health*—Doctor of Public Health

A. Admission requirements

1. M.D. degree from an approved medical school

B. Requirements for degree

1. At least one year of resident work
2. Thesis
3. Completion of an approved course of study selected from the following list:

Course
Bacteriology A1
Lectures in Immunology
Public Health Laboratory A
Research in Bacteriology C
Wassermann Laboratory A
Antitoxin and Vaccine Laboratory A
Antitoxin and Vaccine Laboratory C
Parasitology A
Parasitology B
Research in Preventive Medicine and Epidemiology C
Communicable Diseases A
Research in Communicable Diseases B and C
Tropical Infectious Diseases A
Advanced Work in Tropical and Foreign Medicine B
Public Health Administration A
Physiology A
Research in Physiology C
Nutrition A
Ventilation and Illumination A
Advanced Medical Entomology B
Research in Foreign and Tropical Medicine C
Ventilation and Illumination Research C
Industrial Medicine A
Industrial Toxicology A
Industrial Medicine C
Vital Statistics A
Biomathematics A
Vital Statistics B
Vital Statistics Research C
Research in Biomathematics C
The Statistical Laboratory
The Principles of Sanitary Engineering A
Water and Sewage Analysis B
Research in Sanitary Engineering C
Mental Hygiene A
Elementary Mental Hygiene
Research in Mental Hygiene C
Child Hygiene A
Child Hygiene Research C

In addition, other courses offered in the other schools of the university are recommended. Also those courses in Massachusetts Institute of Technology in the Department of Biology and Public Health are offered, and special work in the clinics, laboratories, and in the field (field work) is available.

The hours for these courses are purposely omitted as they are extremely variable and depend upon the needs of the individual student.

III. *Johns Hopkins School of Hygiene and Public Health*—Doctor of Public Health

A. Admission requirements
1. M.D. degree plus arts or science degree or its equivalent, or
2. Completion of at least three years' work in an approved medical school, plus degree in arts or science, or its equivalent, and selection of specified electives during the medical course

Full registration in the School of Hygiene only after graduation in medicine

B. Requirements for degree
1. Two years of resident work including three months' field work
2. Thesis
3. Completion of the following course of study:

Course
Bacteriology
Immunology
Chemical or Physiological Hygiene
Sanitary Engineering
Parasitology
Statistics
Epidemiology
Public Health Administration
Attendance at lectures in:
Hygiene
Nutrition and Dietetics
Personal Hygiene
Sanitary Law
Quarantine Procedure
Social Economics

(The hours for these courses were not included in the returned requirements.)

Elective courses to be selected from the following list of subjects:

Course	Class Hours
Sanitary Bacteriology. Bacteriology 1	132
Public Health Laboratory. Bacteriology 2	132
Public Health Laboratory Practice. Bacteriology 3	132
(Spirochaete and Venereal Infection.) Bacteriology 4	
(Anaerobic and Aerobic Bacteria.) Bacteriology 5	132
Principles of Immunology. Immunology 1	132
Serological Reactions. Immunology 2	132
Sanitary Engineering	132
Chemistry of Food, Water, etc. Chemical Hygiene 1	132
Chemistry of Metabolism. Chemical Hygiene 2	132
Metabolism of Dietetics. Chemical Hygiene 3	33
Experimental Methods. Chemical Hygiene 4	66
Food Production and Distribution. Chemical Hygiene 5	66
Parasitology. Medical Zoölogy 1	132
Protozoölogy. Medical Zoölogy 2	132
Helminthology. Medical Zoölogy 3	132
Medical Entomology. Medical Zoölogy 4	132
Filterable Viruses. Medical Zoölogy 5	132
Advanced Studies. Medical Zoölogy 7	
Physiological Hygiene. Physiological Hygiene 1	132
Work and Fatigue. Physiological Hygiene 2	66
Ventilation and Climatology. Physiological Hygiene 3	66
Action of Light, X-Rays, etc. Physiological Hygiene 4	66
Personal Hygiene	11
Introduction to Vital Statistics. Statistics 1	130
Laboratory Work in Vital Statistics. Statistics 1A	66
Advanced Statistical Theory. Statistics 2	132
Advanced Statistical Theory. Statistics 2A	66
Colloquium on Vital Statistics. Statistics 3	30
Statistics on Public Health Administration. Statistics 4	44
Introduction to Infectious Diseases. Epidemiology 1	132
Infectious Diseases. Epidemiology 2	55
Public Health Organization	22
Public Health Problems	44
Field Demonstrations	66
Child Hygiene	22
Sanitary Law	11
Social Economics	10
International Health Problems and Quarantine	5

Research work can be arranged in any of the departments and weekly department seminars are held.

IV. *Massachusetts Institute of Technology*—Department of Biology and Public Health—Doctor of Public Health

A. Admission requirements
1. M.D. degree from a Class A medical school, or
2. Bachelor's degree in science from an institution of recognized standing

B. Requirements for degree
1. Three years of resident work following the B.S. in P.H., or one or more years of resident work following the medical degree
2. Thesis
3. Six months of practical field work
4. Oral examination in approved course of study selected from list included under the M.S. in P.H. (Courses included under the M.S. in P.H. degree.)

Courses offered in the Harvard School of Public Health are also available to Technology students.

V. *Yale University*—Graduate School—Doctor of Public Health

A. Admission requirements

1. M.D. degree from medical school of high standing

B. Requirements for degree

1. Two years of resident work, or
2. One year of resident work in the Graduate School for medical students who (a) elect in their second year, public health bacteriology, chemistry of foods and nutrition, industrial hygiene and sanitation, and epidemiology; (b) elect in their third year, practical field work in public health; (c) devote two months during the summer succeeding their third year to fourth year dispensary service; and (d) devote the major part of the first half of their fourth year to electives in public health
3. Thesis
4. Completion of the following course of study:

Course	Class Hours
Public Health Bacteriology. Bacteriology 112b	90
Parasitology. Zoölogy 115b	90
Principles of Public Health. Public Health 101a	90
Principles of Vital Statistics. Public Health 102a	60
Public Health Seminar. Public Health 105	60
Elements of Sanitary Engineering. Public Health 107a	90
Industrial Hygiene and Sanitation. Public Health 110b	30
Chemistry of Foods and Nutrition. Public Health 112	*
Public Health Administration. Public Health 114b	60
Epidemiology. Public Health 115b	30
Control of Communicable Diseases. Public Health 116b	30
Infant Welfare. Public Health 117b	30
Sanitary Law. Public Health 120b	15
Medical Clinics. Public Health 125	*
Sanitary Water Analysis. Public Health 126b	68
Practical Field Work in Public Health. Public Health 104	*

* Hours to be arranged.

VI. *University of California*—Graduate School—Doctor of Public Health

A. Admission requirements

1. M.D. degree from an approved medical school, or
2. Students in medicine at the University of California may substitute a year of the public health curriculum for the fifth year in the medical course

B. Requirements for degree

1. Completion of the following course of study, totaling 60 units:

Course (with units)	Total Hours (Lecture, Lab., Field)
Administration 4. Hygiene 104	128
Bacteriology and Immunology 8. Hygiene 108A, 108B	384
Human Nutrition 6. Household Science 120A, 120B	160
Epidemiology 4. Hygiene 107	128
Protozoölogy and Parasitology 8. Zoölogy 110c, 111	256
Sanitary Engineering 3. Civil Engineering 124	48
Statistics 3. Hygiene 105	144
Mental Hygiene 3. Psychology 168	48
Field Service 5. Hygiene 100	225
Electives 12	

2. Thesis 4

VII. *University of Georgia*—Medical Department—Doctor of Public Health

A. Admission requirements

1. M.D. degree from a recognized school of medicine

B. Requirements for degree

1. Holders of the M.D. degree must have concluded one year's training in the School of Public Health or equivalent and must spend one year in completion of an approved program
2. Thesis
3. Oral examination
4. The program outlined may deal with city, county or state health work in any or all of their respective phases

VIII. *University of Michigan*—Graduate School—Doctor of Public Health

A. Admission requirements

1. Graduation from an approved medical school, or
2. Graduation from an approved college of literature, science and arts, or its equivalent, and completion of the course in medicine at this school, or

3. Graduation from an approved college of engineering or technology in the curriculum of civil and sanitary engineering

B. Requirements for degree

1. A reading knowledge of French or German
2. Two years of resident work including two summers of field work
3. Completion of the following course of study:

First Year

Course	Class Hours
Applied Hygiene	36
Epidemiology and Contagious Diseases	24
Municipal Government. Political Science 3	36
Sanitary Chemistry and Biology	36
Vital Statistics and Their Interpretation	12
Public Health Law, Administration and Publicity	36
Physiological Hygiene	36
Public Water Supplies. Civil Engineering 30	54
Sewerage Course. Civil Engineering 2	36
Microbiology and Parasitology, Advanced	54
Community Problems. Sociology 29	36
Electives	54–36

Second Year

Applied Hygiene	36
Communicable Diseases and Epidemiology	24
Physiological Hygiene	36
Public Health Law, Administration and Publicity	36
Community Problems	36
Water Works	90
Sewerage	60
Vital Statistics	30
Electives	15–20

The remainder of the time is to be spent on thesis and research.

IX. *University of Pennsylvania*—School of Hygiene and Public Health—Doctor of Public Health

A. Admission requirements

1. Graduates of a Class A medical school, or
2. Graduates of a recognized medical school submitting evidence of satisfactory work in physics, chemistry, biology and the languages

B. Requirements for degree

1. At least two years of resident work
2. Completion of the following course of study:

Course	Class Hours
Sanitary Engineering of Buildings	30
Sewerage and Sewage Disposal	
Municipal Water Supplies and Water Works	75
Practical Hygiene	215
Inspection of Meat, Milk and Other Animal Products	75
Helminthology and General Medical Zoölogy	90
Pathology of Tropical Diseases (Optional)	60
Arthropods and Diseases	90
Protozoölogy	90
General Hygiene and Epidemiology	30
Personal Military Hygiene	15
Anthropometry and Physical Education	15
Industrial Hygiene	90
Social and Vital Statistics	15
School Health Inspection	15
Social Service	*
Sanitary Legislation	*
Practical Exercises	*
Sanitary Bacteriology and Immunology	135

* The amount of time spent by the student in Social Service, in Sanitary Legislation, and in Practical Exercises varies with his inclinations and his qualifications pertaining to these subjects.

The second year of the work consists of practical work in the field and in health departments, and the preparation of a thesis.

3. Thesis

X. *University of Western Ontario*—Institute of Public Health—Doctor of Public Health

A. Admission requirements

1. M.D. degree

B. Requirements for degree

1. At least two years of resident work
2. Thesis, and at least twelve months' useful research on thesis subject, subsequent to (3)
3. Completion of the following course of study:

Course	Class Hours
Physics	30
Chemistry. Water, Sewage, Food, Milk, etc.	180
Biochemistry	30
Bacteriology. Water, Sewage, Food, Milk	90
Bacteriology. Wassermann test, agglutination test, etc.	150
Parasitology	15
Geology, Climatology and Meteorology	30
Psychology	30
Sociology	30
Personal Hygiene	20
General Hygiene	*
Mental Hygiene	5
Prenatal Hygiene	10
Infant Hygiene	30
Preschool Hygiene	
School Hygiene	
Oral Hygiene	5
Industrial Hygiene	*
Military Hygiene	*
Sanitation. General, School, Industrial, Military	
Sanitary Engineering	30
Preventable Diseases	30
Epidemiology	30
Contagious Diseases	
Animal Diseases	10
Tuberculosis and Sanatoria	15
Venereal Diseases and Dispensaries	5
Public Health	30
Vital Statistics	30
Public Health Administration	30
Public Health Education	*

* Included in course, Public Health.

DOCTOR OF SCIENCE IN PUBLIC HEALTH

SC.D. IN P.H.

I. *Johns Hopkins School of Hygiene and Public Health*—Doctor of Science in Public Health

A. Admission requirements

1. M.D. degree, or
2. Degree in arts or science

3. Certificates of the satisfactory completion of courses in chemistry, physics, biology, anatomy, physiology and pathology
4. In exceptional cases, on the recommendation of the head of a department, a candidate may be accepted who offers in place of anatomy, physiology, and pathology, satisfactory evidence of special training of an advanced character in subjects fundamental to his main field of work

B. Requirements for degree

1. Completion of three academic years of graduate work, one year, at least, being spent in residence
2. Research in principal subject presented as a thesis
3. Completion of a course of study in advanced work in some one department (See list of elective courses under the Dr.P.H. degree.)
4. Final written examination in the principal and two subordinate subjects
5. Final oral examination

DIPLOMA OF PUBLIC HEALTH
D.P.H.

I. *McGill University*—Department of Hygiene—Diploma of Public Health

A. Admission requirements

1. M.D. degree or other qualifications to practice at least twelve months before they are allowed to receive the diploma

B. Requirements for degree

1. At least one year of resident work
2. Completion of the following course of study:

Course
Bacteriology
Sanitary Chemistry
Physics
Practical Outdoor Sanitary Work
Sanitary Legislation and Administration
Vital Statistics
Meteorology and Climatology
Attendance at lectures in:
Hygiene
Preventive Medicine
Sanitation

3. A knowledge of infectious diseases, of child hygiene, and psychopathic diseases, the use of the meteorological, hygienic and sanitary apparatus; a knowledge of the appearance of healthy and diseased tissues of animals, and their microscopic examination
4. Capacity to formulate a report on sanitary conditions in an actual locality and make annual and other reports as required by officers of health

II. *Queen's University*—Department of Public Health—Diploma of Public Health

A. Admission requirements and requirements for degree

1. Holders of the M.D. degree will be entitled to enter for examination for this Diploma on presenting certificates of having taken the following courses:

Course	Length
Sanitary Physics	3 months
Sanitary Chemistry	3 "
Bacteriological Laboratory	3 "
Advanced Hygiene	3 "
Sanitary Engineering	3 "
Clinical Instruction in a Hospital for Infectious Diseases	3 "
Study with a Recognized Medical Officer of Health, of Practical Sanitation	6 "

2. Holders of the B.S. and M.D. degree will be entitled to enter for examination for this diploma on presenting certificates of having taken the following courses:

Course	Length
Clinical Instruction in a Hospital for Infectious Diseases	3 months
Bacteriological Laboratory	3 "
Practical chemical testing of milk and milk products	1 week
Study with a Recognized Medical Officer of Health, of Practical Sanitation	6 months

III. *University of Montreal*—Faculty of Medicine—Diploma of Public Health

A. Admission requirements

1. M.D. degree from recognized medical school

B. Requirements for degree

1. One year of resident academic work
2. Completion of the following course of study:

Course	Class Hours
Personal Hygiene and Public Health	36
Field Work in Public Health	36
Bacteriology. Theory	28
Bacteriology. Laboratory	28
Chemistry. Theory	28
Chemistry. Laboratory	28

3. Written and oral examination

IV. *University of Toronto*—Department of Hygiene and Preventive Medicine—Diploma of Public Health

A. Admission requirements

1. M.D. degree from the University of Toronto, or other recognized university

B. Requirements for degree

1. One year of resident work including one summer session of three months
2. Thesis
3. Completion of the following course of study:

Course	Class Hours
Laboratory and Lectures in:	
Bacteriology and Immunology	171
Sanitary Chemistry	73
Parasitology	33
Attendance at lectures or practical work in:	
Clinics for Communicable Diseases	
Psychopathic Clinics	
Venereal Disease Clinics	
Tuberculosis Clinics	
Well-Baby Clinics	
Antenatal Clinics	
General Hygiene	
Applied Physiology	
Sanitary Engineering	
Public Health Organization and Legislation, and Vital Statistics	
History of Preventive Medicine	
Epidemiology	
Nutrition and Dietetics	
Industrial Hygiene	

The hours for the lecture or practical work subjects were not specified in the returned requirements.

4. Written and practical examination

V. *University of Western Ontario*—Institute of Public Health—Diploma of Public Health

A. Admission requirements

1. M.D. degree from an approved medical school

B. Requirements for degree

1. At least one year of resident work including two months of field work
2. Completion of the following course of study:

Course	Class Hours
Diagnostic Bacteriology	150
Biochemistry	30
Child Welfare	30
Geology	30
Public Health Administration	30
Public Health	30
Parasitology	15
Personal Hygiene. General, Physiological, Oral	25
Physics	30
Psychology	30
Prenatal Hygiene	10
Preventable Diseases (Including venereal and animal diseases)	45
Tuberculosis	15
Vital Statistics	30
Sociology	30
Sanitary Engineering	30
Sanitary Bacteriology and Chemistry	270
Epidemiology	30
Mental Hygiene	5

In addition to the above strictly public health degrees, many of the institutions mentioned here give the Doctor of Philosophy or Doctor of Science in Public Health upon the same basis on which these degrees are offered in other departments.

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